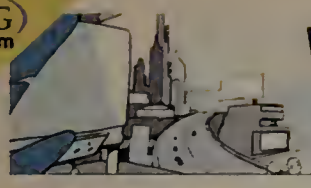
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Wi-fi takes wing



A guide to wireless LANs.



Insert follows page 20.



NetworkWorld

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March 25, 2002 ■ Volume 19, Number 12



IT professional Sue Clark wanted to advance her career, so she invested more than $10,000 in an online network certification course. About halfway through, the school shut its virtual doors.

With U.S. companies investing $1 billion in network-specific IT training in 2001, it's vital that network executives pick IT training schools wisely for themselves and their employees. Find out how to avoid IT training rip-offs in this special report.

PAGE 44

Key directory protocol set for tune-up

■ BY CAROLYN DUFFY MARSAN

MINNEAPOLIS — The Internet Engineering Task Force plans to give Lightweight Directory Access Protocol a facelift.

The IETF's Applications Area has established a task force to coordinate LDAP development, eliminate unnecessary extensions and improve replication. Network managers use LDAP to provide access to distributed directory services, and the current version is supported in software from Novell, Microsoft, Oracle, Sun and others.

"We need to get structure around our discussion of LDAP," says Patrik Faltstrom, a director of the IETF's Applications Area and a Cisco engineer. "We have about

See IETF, page 68

HP/Compaq deal all but final

Users uneasy about details

■ BY APRIL JACOBS AND NETWORK WORLD STAFF

Users have all but conceded Hewlett-Packard will acquire Compaq in the wake of last week's shareholder votes, but there are still plenty of concerns about ongoing product support and the future of the merged company.

Users have expressed concerns that the merger — which is not official yet despite early declarations of victory by HP management— might mean an end to product lines in which they have a heavy investment. Users also wonder how the merged company will support the variety of gear and software it will own.

"The major impact will be in the very obvious product-integration issue," says Jeffrey Fritz, director of networking at West Virginia University. "Is the iPaq going to become a Jornada, or will the Jornada become an iPaq? How will Compaq and HP merge their competing product lines — and how will they support them?"

See Merger, page 67



Cool school nets test security

■ BY ELLEN MESSMER AND PHIL HOCHMUTH

Gigabit Ethernet for kindergartners? Wireless LANs for high schoolers?

That's the trend across the nation as K-12 school districts install high-speed and newfangled networks, granting teachers and students access to large private networks and the Internet. Some districts even have connected schools with carrier-speed metropolitan-area networks (MAN) the likes of which could make a Fortune 500 company envious.

But the rise in school networks — helped by grants from federal and state governments and deals with local cable TV and utility companies — has led to security concerns about hackers and virus outbreaks.

"It keeps me awake at night," says Bill Cook, CIO for the Clovis Unified School District near Fresno, Calif., which has 4,000 staff and 32,000 students at 35 sites.

A Cisco PIX firewall guards the Internet access point in and out of the school district's network, which consists of Ethernet LANs in the schools and T-1 lines in between them. But like the corporate world, the Clovis school district last year was hit by the Nimda virus, causing a network brownout.

The school district, which has PCs in every classroom and is striving to ensure that every junior high and high school student has one to work on, is so worried about security that it just hired a

See Schools, page 14

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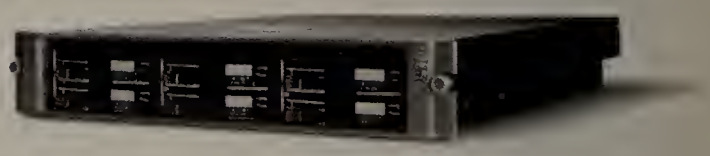
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MICHELLE BARBERA

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IT training rip-offs

Sue Clark's story has a happy ending. After her online IT training school folded, she transferred her $10,000 federal education loan to a new school and completed her coursework. Today, she has a new, higher-paying job as IS network coordinator at Reinhart FoodService in Wisconsin. But companies shelling out money for IT training don't have the same safety net if a school shuts down. Find out how to avoid IT training rip-offs. **Page 44.**

Capacity planning

Capacity-planning tools were originally designed to help network executives plan for new rollouts. Today, those same tools are being redeployed to help manage existing resources. **Page 49.**

Review

We threw everything but the kitchen sink at Cisco's Catalyst 3550 switch, and it kept on delivering wire-speed performance. **Page 51.**


David Swan, senior manager of global network operations, Altera, uses capacity-planning tools for his network.

THOMAS BROENING

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Forums

What do you want from Verizon?

Customers are asked about what else the carrier should offer and what it could do better.
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Ooh, a super ping! Oh my!
Fusion Executive Editor Adam Gaffin says, "Finally, here's a spammer with the guts to be brutally honest."
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Wireless network security
Columnist Ron Nutter answers a reader's question on protecting a wireless network. **DocFinder: 8646**

Telework Beat

Is 802.11 ultimately unfit for the home?
Net.Worker Managing Editor Toni Kistner wonders if all the enhancements to Agere Systems Orinoco AP-200 is an acknowledgement that 802.11b has big problems handling interference. **DocFinder: 8647**

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Wireless ready?

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News Bits

Sun steps up StarOffice pitch

■ Sun's StarOffice 6.0 will come with enhanced features and added support, but at a price, as Sun aims to attract a wider audience — such as businesses — to the office-productivity software suite. A less sophisticated version of the product will still be available for free download from OpenOffice.org, the open-source community Sun sponsors, the company announced last week. "We are positioning this product as a direct competitor to Microsoft Office," says Mike Rogers, a Sun vice president. StarOffice includes word processing, spreadsheet, Web publishing and database applications. Along with Version 6.0, currently in beta testing, Sun will throw in "enhanced support features," such as online and phone support, training and deployment assistance. The software will be available for less than $100 in retail stores and will be sold via a licensing model to companies with significant volume discounts, Rogers says.

■ TheGoodTheBadTheUgly

Time for a change. The Internet Engineering Task Force last week selected its first woman for a key leadership position. VeriSign's Leslie Daigle, a pioneer in search engines, directory and Web services, has been named chair of the IETF's Internet Architecture Board, a technical advisory group that, among other things, serves as a liaison to other standards-setting and policy-making bodies.

Sorry, try again. Verizon withdrew its application to offer long-distance services in New Jersey earlier this week, after the Federal Communications Commission indicated it would not approve Verizon's submission. The FCC expressed concerns that Verizon, which plans to refile for approval shortly, was charging competitors too much to move customers' lines from a Verizon switch to a competitor's.

Michael Powell, FCC chairman, speaking at last week's Cellular Telecommunications & Internet Association conference in Orlando, used the term "messy" to describe the issue of freeing up more spectrum for wireless carriers. "There's nothing clean about it. It is an infantryman's crawl to keep finding more spectrum," he said. ➤



Network Associates to embrace McAfee.com anew

■ Network Associates, which owns 75% of McAfee.com, a publicly traded company it spun off three years ago during the height of the dot-com craze, last week announced its intent to buy up the remaining 25% and repatriate the McAfee.com products and services. Network Associates President Gene Hodges cited several reasons. Network Associates has a division called McAfee that markets antivirus products, and customers were "getting confused" trying to understand the difference between McAfee and McAfee.com, he said. McAfee.com's mission had largely been to provide a variety of hosted security services, including online antivirus software provisioning, which it did under a cross-licensing arrangement with McAfee. McAfee and McAfee.com were sometimes in competition for the same accounts. Hodges said bringing McAfee.com, which has 100,000 customers, back into the Network Associates fold will further the security firm's ability to coordinate strategy in the consumer and small-office markets, in particular.

Net2Phone, ADIR file suit against Cisco

■ Net2Phone and its subsidiary ADIR Technologies have filed a lawsuit against Cisco, seeking compensatory and punitive damages for breach of contract. Net2Phone, a provider of services for voice phone calls over the Internet, and ADIR, which makes voice-over-IP software, allege that Cisco breached a contract with Net2Phone, stole trade secrets, engaged in fraud and unfair competition, and breached fiduciary duties. Net2Phone and Cisco two years ago set up ADIR to make ADIR's software compatible with Cisco's hardware and to ultimately develop a "highly marketable" product for voice communication over the Internet. However, Cisco "seriously misinterpreted" the relationship, failed to support the project and produced its own competing product, according to the suit. A Cisco spokesman told reporters that the lawsuit "appears to be an effort to justify a business failure by filing a lawsuit."

Survey: Developers hail instant messaging

■ A survey of developers building applications for wireless devices such as cell phones and handheld computers pegged instant messaging as the technology du jour, according to a survey released last week. Overtaking e-mail as the most popular wireless application being developed for corporations and consumers, more than half of the 600 programmers polled said instant messaging is their new love, results of a survey from Evans Data showed. Considered by many a consumer application, instant messaging has crept into the workplace at an increasing rate.

In addition to using stand-alone messaging products, organizations are integrating the technology into internal applications so employees can collaborate on projects and communicate quickly over the Internet. About 32% of the developers polled said they are building commercial applications used by consumers and businesses that incorporate instant-messaging technology. Another 23% of developers are developing internal applications with messaging capabilities, and about 10% said they are building instant-messaging applications for individuals or small workgroups inside a corporation.

ACLU to oppose library 'Net filters

■ The American Civil Liberties Union is set to argue before a panel of judges this week that a law requiring libraries to install Internet-filtering measures on public computers in order to receive some federal funding is unconstitutional and violates freedom of speech rights. Congress passed the Children's Internet Protection Act in December 2000 with the aim of shielding minors from obscene and potentially harmful material. However, plaintiffs in the suit say CIPA's Internet filtering provision stymies free speech and research abilities, and deepens the digital divide by giving those who can afford Internet access at home wider access to information than those who can only afford to access the 'Net at libraries.

The civil liberties organization also is expected to argue that many Web site blocking programs are ineffective, often barring sites that are not harmful to minors, and that the filtering is contrary to the democratic mission of public libraries.



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New Novell agenda raises concerns

Company to dump proprietary products, focus on Web, standards-based offerings.

■ BY DENI CONNOR

SALT LAKE CITY — An ambitious lineup of new initiatives from Novell has customers and analysts wondering how the financially strapped company will manage to also modernize existing bread-and-butter products such as NetWare, GroupWise and ZENworks.

The company announced at its BrainShare user conference last week that over the next year it would:

- Consolidate the different management interfaces its products use into one Web-based product.
- Dump proprietary development environments such as NetWare Loadable Modules (NLM) in favor of standards-based protocols and tools.
- Reorganize developers into groups that will stitch products into bundles that will be pitched to high-level IT executives.
- Abandon its NetWare road map and pursue modular 32- and 64-bit versions of NetWare for low- to high-end server and blade server environments.

"I am skeptical that Novell can accomplish this across all products in a timely fashion, and I am somewhat concerned that this has the priority it has," says John Enck, an analyst with Gartner. "They could shoot for a framework solution à la the Microsoft [Management Console] or a Web-based framework, or they could just address the big products like NetWare, GroupWise or ZENworks where the true pain is felt."

Novell officials insist they are not spreading their resources too thin, and they will not forget their installed base.

CTO Carl Ledbetter looks at the development/time problem and sees a solution. He says the new organization will give engineers plenty of time to work on product enhancements.

"One Web-based access tool per product will rip some things apart in engineering because [different groups] use NWADMIN, ConsoleOne, Portal, something else or [nothing] at all," he says. "Now there will be fewer resources applied to interfaces and more to a specific one — where we had seven [engineers] doing specific implementations of [Universal Description, Discovery and Integration] before, now we [can put] three engineers [on it] and get a product in 50% less time."

To get a leg up on the new agenda, Novell announced yet another in what has become a steady succession of company reorganizations — this time splitting its product lines into six groups: eDirectory, Provisioning, Content and Application Management, NetWare, Messaging, and Cross Platform Services.

"The solutions are going to be made up of products that are in our arsenal and that customers know," says Chris Stone, Novell vice chairman. "We just may not know that iPrint is part of a solution. The products aren't going away — if the solution includes existing technology we are going to tell you."

Stone says the company's move to a standard Web-based management interface will be its developers' top priority.

"This company is moving completely to standard interfaces, views and open environments," he says. "All our APIs and interfaces will be based on XML. That's it. There will be no more proprietary interfaces."

Novell will support the Simple Object Access Protocol (SOAP) in the management tools for eDirectory 8.7, expected to ship this June. EDirectory also will support the UDDI protocol in a version that will be released in July. Sources close to Novell say a future version of NetWare, expected to ship in the first half of 2003 and code-named Hayden, will substitute the use of elf for proprietary, hard-to-write NLMs. Elf is a format for executable files, similar to .exe.

Getting rid of some products — Novell has 163 — promises to be part of the company's new plan.

"We are going to look at the products we have, realizing that we have some that are generating little or no revenue," Stone says. "It doesn't make any sense to continue carrying those."

Products like Digitalme, an identity management product, will disappear. Others such as Novell Directory Services' Authentication Services will be rolled into the Novell Account Manager, a product that synchronizes user information from other operating systems into eDirectory. Still others, Stone says, will be jettisoned or sewn into product suites.

Gartner's Enck says, "consolidating Novell's products into bundles strikes me as a reasonable approach to the problem."

However, analysts say that kind of consolidation will be a strain on Novell's development team and on the users' ability to get products in a timely fashion.

"The toughest task facing the development team will be the integration portion of this equation," says Laura Didio, founder and an analyst for Information Technology Intelligence. "For that they definitely need new blood. Melding disparate technologies into a single cohesive package that works seamlessly, and ensuring that the finished product is interoperable with rival products is an extremely daunting challenge for any company — even one that has a fully staffed development team."

As for the single-management interface, users say it solves the problem of working with too many tools.

"It's a pain to use NWADMN32 for some tasks, ConsoleOne for others, separate Java-based utilities for DNS/DHCP and Web-based utilities for even others," says Terry Roedecker, a network manager for a financial institution in the Southwest. Novell's implementation of the DNS/DHCP is accessed through the Java-based iManage utility, which will serve as a model for the single-management console.

"Microsoft has not made it totally to a single interface for management, but their Microsoft Management Console is sure a lot closer to it than Novell's current offerings," Roedecker says.

Users also say that a transition to Web- and standards-based products and development tools is a boon for them.

"When you look at how their snap-ins were designed, a lot of times they took into account code based on the clients you were using," says Sean Walsh, director of core engineering for Mt. Sinai Hospital/New York University in New York City. "As [Novell] moves their products out to open standards, it opens up possibilities for [user] customization." ■

Looking into Novell's future

The company is banking on an ambitious agenda that emphasizes standards-based products.

Product	New features	Ship date
NetWare "Nakoma"	ISCSI support, single install from any location, access from any device, modular, 32-bit, SOAP, PERL, PHP and UDDI support.	1st half 2003
NetWare "Hayden"	Policy-based, 32-/64-bit, elf and J2EE support, designed for server blades, ZENworks for Servers agent.	1st half 2003
NetWare "Uinta"	Self-healing and configuring, 32-/64-bit, high-end server, InfiniBand support likely.	Late 2004
GroupWise "Hawthorne"	Instant messaging, more NIMS-like, contact management.	December 2002
Internet Messaging System "Alta"	Windows NT/2000 version, small business version, synchronization with PDAs.	June 2002
ZENworks for Desktops "Jupiter"	Support for LDAP-compatible directories.	Unknown
ZENworks for Servers "Spartacus"	Measurement and monitoring, self-healing, rollup function for backup.	Unknown
BorderManager 4.0 "Etheria"	Access based on ZENworks, common proxy engine, no Client32.	2nd quarter 2003
SecureAccess	IManager framework, Kerberos support, auditing.	December 2002

Stone called CEO-in-waiting

Novell Vice Chairman Chris Stone's return to Novell was based on the promise that he eventually would succeed Jack Messman as CEO of the long-struggling company, sources say. When that transition might occur remains unknown. Novell would not confirm the reported arrangement.

Stone, former CEO of supply-chain management company Tillion, returned to Novell three weeks ago after a two year hiatus. In his earlier stint at Novell, Stone was executive vice president of strategy and development.

Although Messman has had recent health problems, those problems are said to be unrelated to the plan to eventually elevate Stone to the top spot.

— Deni Connor



It is widely speculated that Chris Stone was promised to succeed Jack Messman as CEO.

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Alcatel draws security architecture

CrystalSec initiative covers company's line of switches, VPN gear.

■ BY TIM GREENE

CALABASAS, CALIF.— Alcatel is set to roll out security hardware and software upgrades that promise to help businesses protect their networks and resources, and make it easier to do so.

The new products will be grouped under an umbrella security initiative called CrystalSec, which will be introduced within two months. CystalSec will encompass products that work with Alcatel's OmniSwitch switch/routers, OmniPCX IP telephony equipment and OmniAccess VPN appliances. In addition to addressing enterprise network security, CrystalSec will define how to harden individual Alcatel devices against attacks.

The most ambitious part of the plan calls for overarching security-management software called SecureView to be incorporated into Alcatel's existing OmniVista software. OmniVista is Alcatel's Windows NT-based software used to manage and set up alerts for Alcatel network devices.

Rather than set policies on switch/routers, IP voice gear and VPN equipment using separate management applications, SecureView running as part of OmniVista will let users set security policies for all devices from a single console.

Ultimately, SecureView will make it simpler to set and distribute security policies across the product lines, says Jeff Hayes, an Alcatel security executive. SecureView software will be announced in the second half of this year.

SecureView is attractive to David Divins, senior network engineer for ServerVault, a secure managed-hosting provider in Dulles, Va., that uses Alcatel VPN gear at its customer sites and switch/routers and IP phone gear in its own network.

"A unified security platform to manage everything could be useful," Divins says. "If we can integrate it into one console, that's one less application you have to worry about. If you just happen to be at someone else's [management station] and if they don't have the right application loaded, it can be frustrating. One app would be nice," he says.

Other vendors, including Cisco with its Cisco SAFE architecture and Enterasys Networks with Safe Harbor, already have established such broad security frameworks, says Chris Kozup, a senior research analyst with Meta Group. But other vendors, including 3Com, Avaya, Nortel and Foundry Networks, have not.

The company also will partner to provide technology to supplement Alcatel's own, Hayes says. Later this year, Sygate's firewall will be integrated with Alcatel's VPN Client Software so VPN policies and firewall policies can be managed together using Sygate's firewall policy tools, he says.

Alcatel also is introducing VPN hardware called OmniAccess 210. This device is designed for branch offices that have T-1 or fractional T-3 connections to the Internet. It can connect to 500 other VPN devices simultaneously.

It can perform Triple-DES at 12M bit/sec and the new Advanced Encryption Standard at more than 40M bit/sec, Alcatel says.

The device has three 10/100M bit/sec Ethernet ports and would be placed between a firewall and the LAN.

The device is the first of a series of VPN gear Alcatel will roll out this year. It is the first hardware addition to its VPN line since the company bought Newbridge Networks roughly two years ago. While Alcatel will continue to support this older gear, it expects users to migrate to the 200 series because it offers more capacity at a better price.

OmniAccess 210 lacks a firewall initially, but Alcatel says it will add one later this year.

The box costs $4,000 if it is set up to connect with other VPN gateways only. It costs $5,000 for a version with 20 licenses for VPN software that runs on PCs. It costs $8,000 with unlimited PC clients. ■

Crystal clear

Alcatel will roll out a security framework that covers its OmniSwitch, OmniPCX and OmniAccess gear to make LAN security stronger and simpler to manage. Called CrystalSec, it includes:

- Securing OmniSwitch, OmniPCX and OmniAccess gear from attacks such as denial of service.
- Encrypting management traffic to devices.
- Providing network security such as VLANs, firewalls and VPNs.
- Offering common security management among devices.
- Gaining technical certifications such as Federal Information Processing Standard.
- Teaming with other vendors to provide complete product sets.

Nauticus takes aim at SSL bottlenecks

■ BY JENNIFER MEARS

FRAMINGHAM, MASS. — Start-up Nauticus Networks is readying a data center switch it says will offer the scalability and performance businesses need to handle the increasingly sophisticated applications they're putting on the Web.

The company says its Nauticus Application Switch, which will be announced this week and become generally available by fall, will combine Web server load balancing with Secure Sockets Layer (SSL) acceleration, eliminating the need for separate boxes to handle those chores. Nauticus says the switch will handle tens of thousands of SSL connections per second, dropping the cost of supporting SSL from $10 or $15 a session to about 50 cents, the company says.

In its first iteration, the switch will support 10/100M and 1G bit/sec Ethernet LANs, though the company declined to provide specific details such as the number of LANs supported. Future releases will support advanced security such as intrusion detection, Web services and server-side caching.

Nauticus was founded by the team that launched Layer 2/Layer 3 Gigabit Ethernet switch maker Prominet, which Lucent acquired for $200 million in 1998. In addition to introducing the company and its switches, Nauticus will announce the close of its second round of funding next month, bringing total funding to $33 million. The company's investors include Charles River Ventures, Matrix Partners and North Bridge Venture Partners.

"We've taken the attributes of the high-performance switches, like an Extreme or Foundry switch, which is hardware-based switching, taken the characteristics of the software-based appliances like F5 and merged those by putting application switching and SSL processing in hardware," says Joshua Weiss, a former Lucent and 3Com executive who co-founded Prominet and is now Nauticus' CEO.

"We're saying the traditional switch guys don't have it right and the appliance guys don't have it right. But they both have pieces of it," says Douglas Barta, a Nauticus vice president. "So we merged those two worlds."

Nauticus aims to reduce the amount of hardware and systems a network manager needs to support Web-based applications. Nauticus switches use silicon-assisted processing to offer better performance and scalability than software-based appliances on the market today, Weiss says. As a result, the switch can perform basic Layer 2 and Layer 3 packet-level switching functions and more sophisticated intelligent switching at Layer 7, the application layer.

Nauticus is targeting its switches at businesses that are developing Web-based applications with high-security demands, such as those in the financial services and healthcare industries. Web hosting service providers also are looking at the switches to provide better service.

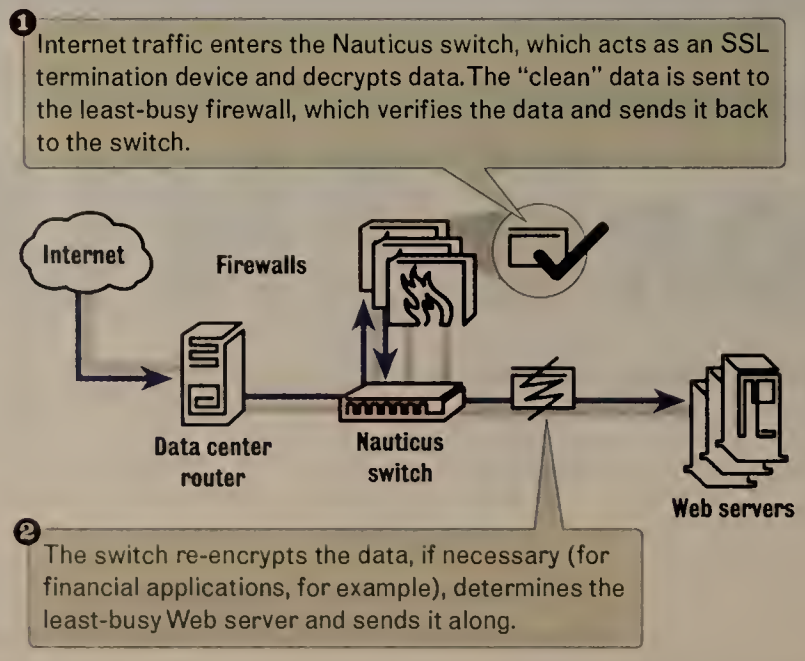
Mark Greenlaw, director of network engineering at Digex in Laurel, Md., is interested in testing a Nauticus switch because of its promise to reduce the costs associated with supporting multiple devices and user interfaces.

"Nauticus is talking about performance numbers that blow away what we are using now," he says. "SSL acceleration at these speeds will allow Web developers to secure a whole site, as opposed to having to pick and choose. A product that allows you to do ubiquitous encryption in a scalable fashion would be something that people would look at."

Nauticus: www.nauticusnet.com

Fast lane

Nauticus Networks plans to ship a high-speed application switch that combines SSL offloading and server load balancing.





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COMMUNICATION WITHOUT BOUNDARIES

Vendors prioritize access control wares

■ BY JOHN FONTANA

As the Microsoft and Sun camps begin to do battle over standardized single sign-on services, makers of access management products are trying to create an insulating layer of software to protect IT executives from the collateral damage generated by that conflict.

The vendors hope to give companies a means to support any identity management system that provides single sign-on authentication for access to Web-based resources, without IT having to bet on one technology or suffer through integrating or supporting two or more.

Access management software works with a directory and sits atop Web-based systems to provide single sign-on based on a set of policies. The thought is that the software will map emerging identity management services to current enterprise access policies.

"It makes sense to start creating that layer," says Daniel Blum, an analyst with Burton Group and a *Network World* columnist.

"The access management products have fulfilled that role historically," he adds.

Blum says identity management is an early stage of a trend toward better security for Web-based services that will provide opportunities for business-to-business commerce to scale. "Enterprises can't afford to manage millions of identities because there is a cost associated with maintaining user accounts. If someone else maintains authentication data, it can generate a cost savings."

Last week, OpenNetwork Technologies announced that it's DirectorySmart product will support Microsoft's Passport, a single sign-on service that provides authentication to any site or application that supports Passport (see related item, page 25). The move comes a month after Oblix announced support for Passport in its NetPoint access management software.

Both vendors say they also will support an open single sign-on specification being developed by the Liberty Alliance Project, a collection of vendors and end users brought together by Sun. And the vendors also plan to support the Security Assertion Markup Language (SAML), an emerging standard for exchanging authentication and authorization data. Other vendors, including IBM, Netegrity and RSA Security, are likely to follow.

"The biggest problem is you have Liberty, Passport and SAML, and any enterprise running Web applications is going to have to find a way to support all of them," says Nand Mulchandani, CTO and co-founder of Oblix. He says Oblix is creating an Identity Federation Layer in NetPoint that will take external identity services and map them into a NetPoint identity.

"Where federation comes in is how do you manage these disparate IDs," he says. "We have to be able to switch authentication from a nonlocal context over to a local context. Ultimately it's about coordination and building trust."

There isn't much trust now because the Microsoft and Liberty camps are only playing lip service toward cooperation and compatibility while developing their own infrastructures, experts say.

Microsoft is already adding to Passport support for Kerberos, a standards-based authentication technology, and will tie that with Active Directory. Sun recently announced Sun ONE Platform for Network Identity, hardware and software components, including the iPlanet Directory, for identity management that will eventually support Liberty.

While both sides claim to be creating a "federated" service, which allows users of the same technology or compatible technology to interoperate, currently they are not on the same path.

Blum says the efforts have to be considered in context given that Liberty does not yet have a specification, Passport is still mostly a consumer service, and SAML is still under development. ■

ID check

A number of technologies that provide authentication and single sign-on services for use across extranets and the Internet are gaining visibility as security options for Web-based distributed computing.

Liberty Alliance Project: A collection of 38 companies, including American Express, AOL Time Warner, United Airlines and Sun, are working to create an open single sign-on identity specification.

Microsoft Passport: A single sign-on technology that has about 200 million registered users. Microsoft is tying Passport to its support of Kerberos, an authentication standard.

Security Assertion Markup Language: SAML, based on XML, is used to represent authentication and authorization data for an individual user and to pass that data around. Any number of sources, including directories or public-key infrastructure systems, can produce the data.

ISS bolsters security analysis

Company plans to blend Network ICE technology with its other offerings.

■ BY ELLEN MESSMER

ATLANTA — Internet Security Systems this week will outline plans for software designed to collect and analyze security data from multiple vendors' gear, a move the company hopes will help differentiate it as the intrusion-detection system market becomes crowded.

The company's first step in presenting customers with a common view of their network security will be to integrate technology obtained through its acquisition last year of high-speed firewall/intrusion-detection system (IDS) maker Network ICE into the overall ISS product line. That will include enabling ISS's SiteProtector and Network ICE's IceCap Manager software packages to combine on event management and security analysis, and pruning the management line to one offering by summer.

By year-end, ISS plans to have management software that can receive security-related information from competing IDS products and other types of products, including Netegrity's SiteMinder Web access-control software and Cisco and Juniper routers.

The integrated management push will pit ISS against a host of competitors, including IBM Tivoli and newcomers such as NetForensics and eSecurity.

Despite ISS's ambitions, not all customers are convinced the company is making a good move.

"It's outside their core competency," says Philip Maier, vice president of information security engineering at Inovant, a Visa International subsidiary.

Maier wants to combine information from a slew of resources — antivirus software, routers, firewalls, authentication servers and IDS products — to get a better read on security threats, but doesn't plan to wait for ISS, which hasn't impressed him with its current SiteProtector offering. Maier last week spoke at the InfoSec conference in Orlando.

ISS, a trailblazer in the IDS market for six years, is struggling to keep its sheen as new challengers emerge. This week, yet another upstart — called IntruVert Networks — will make its debut with a network sensor it says is capable of spotting attacks and stopping denial of service.

While IntruVert may not worry ISS now, the aging nature of its own RealSecure sensors does. It was the inability of the ISS RealSecure sensors to reach the close-to-gigabit speeds of products from newer rivals that prompted the company to buy Network ICE last June in a $228.5 million stock swap. The deal, which contributed to ISS's $15.5 million net loss on $223 million in revenue last year, brought ISS products it needed in Gigabit Sentry and the Black ICE desktop firewall/IDS.

ISS plans to redesign its 100M bit/sec RealSecure Network Sensor so that Version 7.0, to be available this summer, will use the Network ICE technology. "We're definitely taking the best of Black ICE, such as its strength in analysis and blocking," says Rich Telljohann, director of enterprise solutions at ISS.

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Schools

continued from page 1

company called TruSecure to perform a vulnerability-assessment across the system.

"It's to reduce the possibility of hacking," says Cook, who recalled one instance when a hacker hijacked school servers to distribute copyrighted material. "We had inadequate information-security practices in place."

And it's not just outsiders trying to break into school servers and PCs; it's the students.

Clovis school district is tightening security in several ways on its 10,000-node network. Currently, the schools' 802.11 wireless LANs, mainly from Avaya, let anyone with a wireless access card connect without proper authorization. But in the fall, Clovis will require registration of the media access control address of each Ethernet card, wired or wireless, to be attached to each student name. "Our motivation is to get their laptops 'certified,' and our support staff will inventory the software on the machine," Cook says.

In addition, students, parents and school staff have to sign "acceptable-use policy" documents to use the network and Internet. This legal document notes that files, e-mail and other information on the district's equipment are subject to search at any time and that there are no privacy or ownership rights in that information, regardless of having any personal password.

An "A" in infrastructure

At the Exeter School District in Pennsylvania, a deal with the local cable TV provider let the school build a low-cost metropolitan Ethernet network, with T-1 access to the Internet.

"You could consider what we have to be a MAN," says Joe Way, network manager for the schools. Way has connected Exeter's high school, middle and elementary schools with a combination of Cisco 3600 routers and wave division multiplexing (WDM) transceiver gear from Radiant Communications. WDM lets the district run eight 1-gigabit channels over the schools' fiber backbone, providing ample bandwidth for Exeter's 3Com voice-over-IP system and letting it centralize servers and eliminate interbuilding T-1 lines, which cost around $2,000 per month.

With the advanced network come security requirements to keep children safe and protect the schools' resources from hack-savvy kids.

"Kids are smart . . . they could easily [track down] our school's core addresses if they wanted to cause mischief," Way says.

Way uses a mix of security applications: Riverdeep's FoolProof Security software for locking down PC configuration; N2H2 for filtering content from inappropriate Web sites; and Packeteer traffic-shaping software to squeeze bandwidth for MP3 downloads or to drop Internet chat traffic, which is forbidden by the schools' acceptable-use policy.

Way also takes advantage of policy management on 3Com SuperStack III 4400 Layer 4 switches to prevent traffic from student PC labs from touching administrative servers. He also is upgrading his firewalls with Cisco PIX boxes and adding Cisco intrusion-detection software.

Another protection scheme

In Washington state, the local and state government helped Central Valley School District near Spokane build a network to support 11,000 students and 1,500 staff at 23 sites.

The district maintains three T-1 lines, which cost about $6,000 per year but are paid for by the state. T-1s also hook Central Valley to Washington's "K-20 Network" for kindergartners through high school for all 296 school districts, according to George Amend, instructional technology supervisor at Central Valley.

The district's Ethernet-based, LANs are getting larger and faster, with two new high schools scheduled to be built by this fall with gigabit-speed connections into each classroom from a fiber-optic backbone. Integration firm Tylite is installing the network with Central Telecom East for about $450,000. The schools also will run their phone system on the network.

With the users at the school district being mainly children, there is a strong need for protection from the uglier side of the Internet, particularly pornography, Amend says.

The federal law known as Children's Internet Protection Act requires schools to filter for inappropriate content and the district's local school board establishes a specific policy for the Internet, in this case banning content related to drugs and alcohol, violence and pornography.

The district filters out this kind of content using N2H2's CyberPatrol at its Internet gateway. The school pays N2H2 about $9,000 per year to keep the list of undesired content updated. Central Valley, which has one main Internet access point, uses Symantec's Norton AntiVirus product to filter known viruses. Amend says school district personnel watch the CERT Coordination Center's Web site for security alerts, spreading news by fax about problems.

Like Clovis in California and Exeter in Pennsylvania, Central Valley has an acceptable-use policy that students must sign, though each school may have its own variation.

"You can't go to an auction, play games or pick up your personal e-mail, and there's no chat room online," Amend says.

Inappropriate use can lead to disciplinary action, but the biggest concern is dealing with hackers — especially the district's students. "When we catch them — and it has happened — the student is suspended or dismissed," he says. ■

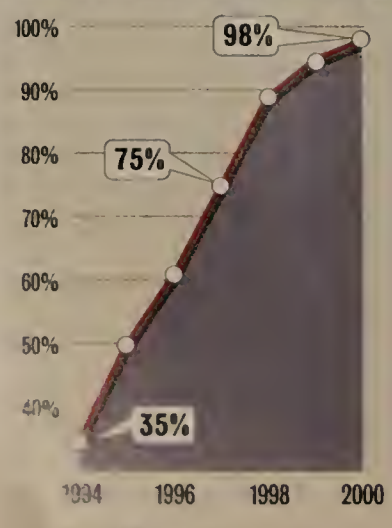


A computer lab plugged into the Web at South Pines Elementary School in Opportunity, Wash.

Virtual classrooms

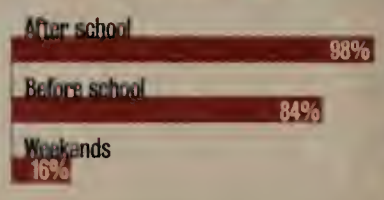
With the ubiquity of Internet access in public elementary and secondary schools . . .

Percent of public schools with Internet access
(based on annual surveys of approximately 1,000 schools)



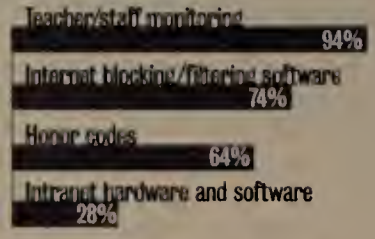
. . . and the openness of access policies . . .

Percent of public schools that allow Internet access outside of school hours*



. . . a variety of technical and hands-on security methods are used widely to stop system abuse.

Security technologies and procedures used*



SOURCE: NATIONAL CENTER FOR EDUCATION STATISTICS

*Based on a 2000 survey of 1,193 schools with acceptable-use policies.

The Scoop

The news behind the news

Ways to land a cheap WAN

The boom in network buildouts in some school districts is because of creative negotiating between state and local governments and service providers.

"If a you're running the school network, you may want to review your town's current arrangement with the local cable company," says Curtis Lee, director of technology of the Pasadena Unified School District in California.

By negotiating with cable company Time Warner and Pacific Bell, Pasadena secured its own strand of single-mode fiber-optic cable throughout the district, which it uses to connect five schools and an administration building via Gigabit Ethernet. Time Warner let Pasadena buy the fiber at cost while the cable company installed it on PacBell-owned utility poles when Time Warner upgraded its network.

In addition to getting the fiber, which would have been impossible for the district to afford on its own, Lee installed Layer 3 Gigabit Ethernet switches from Allied Telesyn throughout the district. The switches — with a mix of 10/100M bit/sec ports and single-mode Gigabit Ethernet uplinks — cost between $1,500 to $2,500 per building to install, compared with the $3,000 to $5,000 for competitive gear from Cisco, Extreme Networks and 3Com, Lee says.

"It's basically the fastest, cheapest WAN you've ever seen," he says.

— Phil Hochmuth

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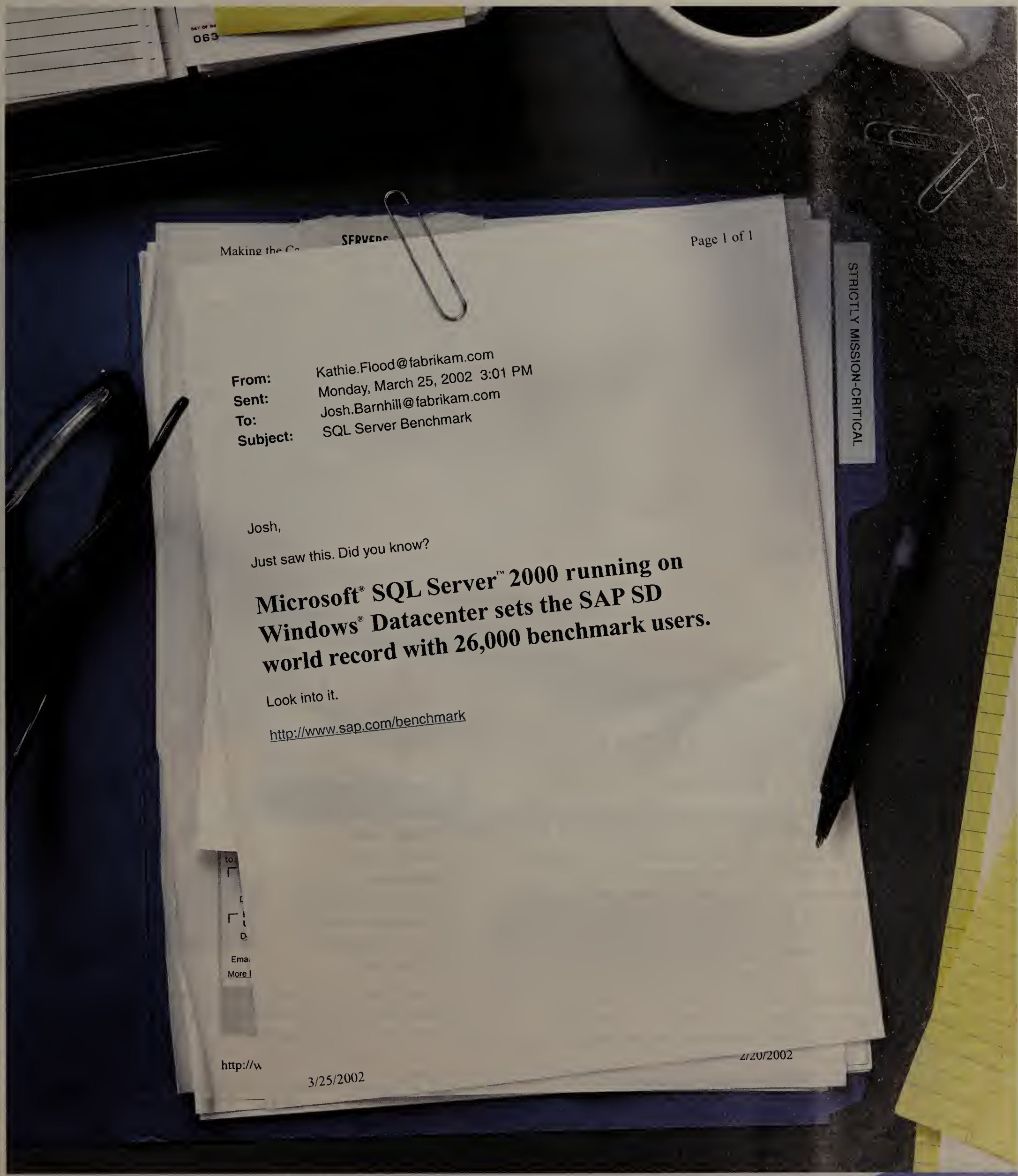


THIS WEEK'S QUESTION:

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Short Takes

■ **EMC** and **Dell** last week jointly announced upgrades to several storage management software products, opening new data back-up options to users. EMC has souped up its **ControlCenter Navisphere, MirrorView** and **SnapView** software products with features that let administrators back up data more frequently and make it easier to send copies of information over long distances. The new software will run on EMC's Clariion storage server, which is one of the main pieces of hardware Dell agreed to resell under the companies' pact announced last October. With Navisphere 6.0, users can manage their storage systems via any Java-equipped browser, letting administrators tweak system configurations remotely. MirrorView software lets administrators copy data between locations over Fibre Channel networks. The SnapView software also was upgraded to let users make more copies of data sets than with previous versions of the product. The software will be available next month, but no pricing was announced. www.emc.com

■ **Intel** opened up new doors last week to vendors that make blade servers, offering a low-power server chip that lets them pack two processors in each server. **Fujitsu** and **Dell** are the first vendors to announce plans for dual-processor blade servers based on Intel's new low-voltage Pentium III chip, which runs at 800 MHz. The servers are expected to arrive later this year, targeted at users looking for compact systems to serve up Web pages and e-mail or to handle firewall tasks. **RLX Technologies** and **Compaq** already sell blade servers using what Intel calls its ultralow-voltage processor, but that chip has not yet been optimized for use in dual-processor systems, an Intel spokesman says. The ultralow-voltage chip operates at 1.1 volts and the low-voltage chip operates at 1.15 volts. Processors that operate at lower voltages tend to generate less heat than other chips, letting hardware makers cram more servers into a standard rack.

In Site: Lessons from Leading Users

San Diego taps IP network for video delivery

■ BY JASON MESERVE

The image of not-so-Web-savvy government, particularly at the local level, is being turned on its ear by the city of San Diego's video-over-IP network that delivers live cable broadcasts to Internet users and internal surveillance video to the local law enforcement community.

San Diego is in the process of building its own content delivery network using Network Appliance caches and Cisco routers and switches, all connected by a high-speed backbone, serving about 10,000 nodes. The network, known as REMNet (Reliable, expandable management network), delivers up to 200M bit/sec to the desktop, more than enough for delivering good-quality video to each user that requests it. It also uses caches outside the firewall to better serve San Diego residents.

Still in development, the network already is serving 200 simultaneous streams to the public via the Internet at all times, says Allen Myers, chief networking architect for San Diego Data Processing Corp. (SDDPC), the 300-person IT arm for the city. The programming content originates from the city's cable head-end and is served in Windows Media and RealNetworks format, both at 100K and 56K bit/sec. Most of the content is city promotional information and government-related meetings such as city council sessions and mayoral addresses.

Content is available 24 hours a day, seven days a week — a big increase over four or five council sessions the city offered previously when it used a service provider to encode and serve the streaming media to the Internet. Each session broadcast over the Internet cost the city between $4,000 and $5,000.

"It was costing us significant money for a few hours of streaming video," Myers says. "In our first year [of serving internally], our return on investment is basically even, since the cost of the equipment is the about the same as what it cost us to outsource just city council sessions, but now we can do 24-7 video."

Raw video is encoded at the cable head-end using StreamFactory and StreamGenie from Pinnacle Systems. The software runs on a specialized

See San Diego, page 18



More online!

The Wisconsin State Assembly has streamed audio versions of its debates over the Internet for the past 3 1/2 years.

DocFinder: 8630

NextGig boosts database performance

Company's Query Optimizer acts like a Layer 4 switch to help users speed transactions.

■ BY DENI CONNOR



NextGig's Query Optimizer appliance intercepts all packets destined for the database and accelerates read requests.

SAN DIEGO — Start-up NextGig expects to help users speed their databases with a hardware appliance that acts like a Layer 4 switch and learns to react based on how people use the database.

Code-named NextGig Query Optimizer, the gear is a 2U (3.5-inch) high appliance that sits in front of a database server and connects to a network with Fibre Channel or 10/100/1000M bit/sec Ethernet connections and inspects each incoming packet looking for read requests it can accelerate.

NextGig Query Optimizer, which the company will ship before year-end, passes packets to the database at 18G bit/sec and accelerates the processing of them by as much as 10 times, NextGig says. Query Optimizer works only with Oracle databases, but the company says that it will work with other databases in the future.

One Oracle database administrator, while not having seen the product, says he is intrigued by NextGig's appliance.

"While I can definitely see a need for a product like this in a highly transactional environment, I would be curious to see if the overhead of the additional layer of processing would hinder the performance of less transactional environments," says Greg Arpino, database administrator for WebRoyalty.com in Norwalk, Conn.

NextGig was founded by Cary Jardin last year. Jardin also was the founder of iPivot, a maker of Secure Sockets Layer acceleration appliances, which he sold to Intel in 1999 for $500 million. This month, Jardin named Karl Powell, former CEO and founder of system manufacturer Sequent, to the CEO slot. IBM acquired Sequent from Powell for $816 million in 1999.

The NextGig appliance differs from solid state disks from Solid Data and Imperial in that they are attached as storage devices to a server and act as cache repositories for database redo logs and indexes.

It also differs from InfoCruiser's dbCruiser-100 appliance, which sits to the side of a database server out of the line of traffic. InfoCruiser also only uses Java Database Connector and Open Database Connector protocols to access database operations rather than the faster Oracle driver that NextGig uses.

NextGig declined to provide prices.

NextGig: www.nextgig.com

WIRED WINDOWS

Dave Kearns



Whose side are you on, Novell?

It wouldn't be fair to judge new Novell honcho Chris Stone's performance at last week's BrainShare in Salt Lake City, because he's only been with the company a couple of weeks.

It wouldn't be fair to blame the marketing thrust seen at BrainShare on Novell's new "chief marketing officer," Debra Bergevine — she'd only been in place one day when BrainShare started.

So I'm not sure who is most responsible for the new marketing direction the company unveiled (but I'd wager it was someone with a Cambridge Technology Partners background), but I do know you should be concerned.

Not once, not twice, but many times during the opening keynote address at BrainShare little marketing vignettes and demonstrations were inserted — almost all of which had as their theme the unresponsiveness of the IT organization. From hardware problems to provisioning to access difficulties, these little playlets all showed that the real fault was the help desk, the IT department, the troubleshooters — the tech types. When users were empowered to design and set up their own environment, everything ran smoothly.

Of course, we know these services don't install themselves. So we also heard that Novell, through its Cambridge Technology Partners consultancy, wanted to partner with companies to deliver these services. The message was clear and simple: IT is holding you back. Contract with our organization, which will install our products along with services that users can self-provision, and all of your computer problems will be over.

It's a message that consultants have brought to the executive suite for years. Up until now, Novell has been our (that is, the IT department) partner in the ensuing struggle. Looks like it might want to change sides. Here's hoping Stone (with Bergevine's help) can nip that in the bud.

Kearns, a former network administrator, is a freelance writer and consultant in Silicon Valley. He can be reached at wired @vquill.com.

Tip of the Week

Last year after BrainShare, I was very high on Novell's iFolder technology to synchronize data among all of a user's platforms. This year, **iFolder 2.0** was announced, and it's even better. For any user who works in more than one place, this is a must-have.

Site: Lessons from Leading Users

San Diego

continued from page 17

multiprocessor box and can create both the Real and Microsoft streams simultaneously, Myers says. Network Appliance's ContentDirector and F85 filer content storage products are used to push the video through the firewall to a Network Appliance's NetCache C1100 streaming media cache for public consumption. This lets SDDPC keep public access outside the city network.

Caching content

Internally, Myers is deploying caches to roughly a dozen major city offices so internal video on-demand content can be retrieved locally, saving bandwidth on the WAN that connects city offices. (The WAN consists of some ATM connections but is being migrated to Gigabit Ethernet.) A combination of multicast and unicast technology is used to maximize the use of bandwidth when pushing and service video on the internal network. Once the major locations have caches installed, Myers hopes to drop caches into smaller police and fire stations.

In addition to streaming more video and using the internal network resources more efficiently, one of the project's goals is to deliver training videos over the city intranet. Police, fire and other city workers could watch the training from their own buildings, with the streams delivered from a local cache.

City officials still have to work out operational issues that are impeding that goal. Myers says procedures have to be developed for who manages the training materials and ensures all the caches have the most up-to-date content.

Though not fully utilized for training on demand, San Diego's IP network is being used for some video surveillance applications involving proprietary and standards-based technology.

"We're doing different types of monitoring — some security-related, some more operational," Myers says. Though he couldn't go into detail, he says the monitoring technology is "real strategic stuff" and involves local, state and federal offices located in the greater San Diego area.

Wireless visions

Myers envisions using wireless technologies to deliver video of a building to a police officer's PDA so he can view the premises he's about to enter.

SDDPC hopes to migrate its voice network to IP as well. Myers says the network is capable of voice over IP in some locations, but the city is still in the proof-of-concept phase. To move forward, more of the legacy network equipment needs to be modernized.

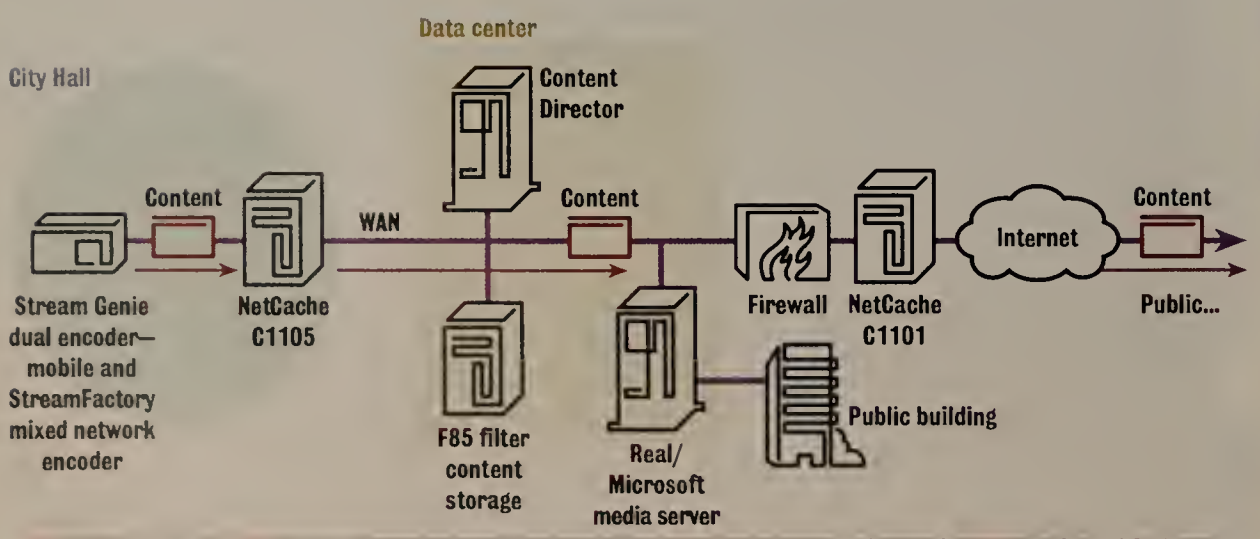
The new network has paid dividends. Under the old outsource system, the city received only about 800 hits per month to its video feeds. Today, it's nearly triple that — about 2,100 to 2,500 hits per month.

City councilors are creating individual portals to deliver messages to constituents in their districts. Also, Myers says the city is videotaping miles of sewer system, with the video stores on the network for reference purposes in case something happens to a line.

Online even trumped cable TV: During the recent mayoral address, the cable television feed had some technical glitches while the Internet video performed flawlessly. ■

Do it yourself

The city of San Diego built its own IP-based content delivery network that saves the city money and delivers video 24-7.



1. Audio/video content is encoded at the cable head-end in City Hall.
2. Network Appliance's ContentDirector, cache and Real/Microsoft media server store and route content to the proper edge caches at other municipal buildings or to public-accessible caches.
3. A cache outside of the firewall is used to serve the public while protecting the city's network from intruders.
4. Citizens can view content in Real or Windows Media format at 56K bit/sec or 100K bit/sec.

QUICKTAKE

Allied box makes VLANs easier

Allied Telesyn's new stackable switch, the AT-8326GB, is billed as a cost-saver for deploying Gigabit Ethernet and a time-saver for network professionals who have to install and configure the device on a LAN.

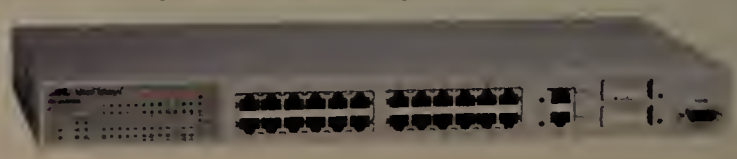
Offering a combination of different Gigabit Ethernet media and automatic virtual LAN configuration with other compatible devices, the new box could help a company looking to expand its network, or build a new infrastructure from scratch.

The AT-8326GB is a 24-port 10/100 Base-T switch with two fixed copper Gigabit Ethernet ports and two gigabit interface converter slots for extra copper or fiber gigabit uplinks. The switch also can support the Generic Attribution Registration Protocol VLAN protocol that can allow the switch to be placed on a network configured with 801.1Q VLANs and accept all VLAN settings from GVRP-compliant switches.

The box also supports 802.3ad Link Aggregation for tying multiple gigabit links into a single virtual pipe, which could be used for interswitch links or connections to multi-network interface card servers. The switch is also manageable with SNMP and remote monitoring and comes with an embedded Web server for accessing configuration settings.

The AT-8326GB is available now for $1,300.

Allied Telesyn: www.alliedtelesyn.com



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June 13	•	Toronto

* Planned dates and cities subject to change

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A supplement to NetworkWorld

3.25.02

Wi-Fi takes wing



Inside

- Ready or not, a Wi-Fi wireless Ethernet world is emerging all around you. Page 5.
- Installing Wi-Fi isn't hard, but doing it right can be: A practical guide. Page 8.

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Wi-Fi world

What if wireless Ethernet becomes as ubiquitous as cell service?

■ BY JOANIE WEXLER

Gwenn fires up her laptop at the breakfast table and, through the wireless Wi-Fi Ethernet link in her house, logs on to the corporate VPN to check her e-mail before leaving for the airport. She'll get coffee at Starbucks, which has a public Wi-Fi service, and she figures she can run the numbers her boss is asking for and send them from there.

At the airport she logs on one last time before boarding the plane, downloads the PowerPoint slides she'll need for her presentation and double-checks the timing for the videoconference she intends to include in the presentation once she has a Wi-Fi link set up at the conference center in San Jose.

Welcome to the Wi-Fi reality waiting around the corner. Wireless LAN services are popping up in so-called "hot spots" across the country — airports, hotels, restaurants, cafés and convention centers.

There are already a few thousand Wi-Fi-enabled locations worldwide, says Amy Cravens, an industry analyst at Cahners In-Stat. That's enough to whet user's appetites, but the number "won't really take off until most corporate environments have wireless LANs," she says.

ILLUSTRATIONS BY ISTVAN BANYAI

However, the industry faces some serious issues that may stymie ubiquitous service, including:

- Fragmentation among wireless LAN services. The services today are offered primarily by little-known wireless ISPs such as AirPath, Concourse Communications, Surf and Sip, and Wayport.
- Lack of roaming agreements. The wireless ISPs only offer islands of wireless LAN connectivity.
- Unproven business models. After Wi-Fi enabling several hundred Starbucks locations and other properties, MobileStar Network filed for bankruptcy late last year and sold its assets to VoiceStream. It is unclear how partners in Wi-Fi services can make money.

"The state of the hot-spot supply chain is a nightmare right now," says Ian Keene, vice president and chief analyst in the telecom practice at Gartner. "The business model was straightforward until last year. Then the property owners woke up and wanted control—and a share of the revenue."

Nonetheless, there is a Wi-Fi ground swell that is hard to mistake.

Wi-Fi drivers

As wireless LANs grow within corporations, the desire to extend support follows naturally. Cahners estimates that the number of 802.11-based access points shipped each year will nearly triple from 1.2 million in 2001 to 3.5 million in 2005. The firm expects yearly 802.11 network interface card (NIC) shipments to jump from 6.3 million last year to 19.4 million in 2005.

In fact, most of the major notebook computer makers ship products today with embedded 802.11 NICs. Combine that with the fact that Microsoft has embedded Wi-Fi capabilities into Windows XP and it is clear that, like it or not, there is a Wi-Fi user base growing up around you.

The XP operating system automatically searches for a Wi-Fi access point and, if it finds one, asks the user if he would like to use the service. "We had users signing up for our service before it was even announced," says Tim Barrett, vice president of AirPath.

Wi-Fi support can indeed draw business. Mark Hedley, CTO at hotelier Wyndham International, based in Dallas, says his company is "most certainly taking conference business away from other hotels" thanks to the 802.11 connectivity in 148 of its properties.

Wireless provider Wayport ate the up-front capital costs, Hedley says. "You won't likely see much more of that in the wake of the dot-com demise. At the time, everyone expected a 20% consumption rate, but it's actually been more like 2% to 4%."

Unified roaming

The biggest challenge for users now is lack of unified roaming. Users must subscribe to individual wireless ISPs in each area they frequent, making it not only inconvenient but also difficult for the corporate network group to track usage and billing.

The industry is trying to standardize a settlement process through which carriers would sort out who gets paid when a customer roams from one service area to another.

In the meantime, aggregators and clearinghouses are stepping in. They partner with multiple wireless LAN service providers, aggregate the players' networks to create a merged footprint and put a common brand on the services.

Wireless ISP aggregator Boingo, which launched its services in January, is "partnering with every Wi-Fi [wireless] ISP we can find to build out our network," says Christian Gunning, director of product management. "It is cost-prohibitive for a single carrier to be ubiquitous. But having a patchwork of [Wi-Fi] locations and different ways to authenticate themselves and log on is confusing and difficult for users."

Longtime IP remote-access players iPass and Gric — which aggregate and broker worldwide dial-up IP services — also have begun expanding their services to include wireless LAN offerings.

And where are the traditional carriers, ISPs and mobile network operators in all this? They're remaining mum, for the most part.

Even VoiceStream, the company that purchased MobileStar's assets, will only say that the 500 Starbucks stores and American Airlines Admirals Clubs that MobileStar serves remain connected — for now. A spokeswoman says it is too early to predict where VoiceStream will take its public Wi-Fi business next.

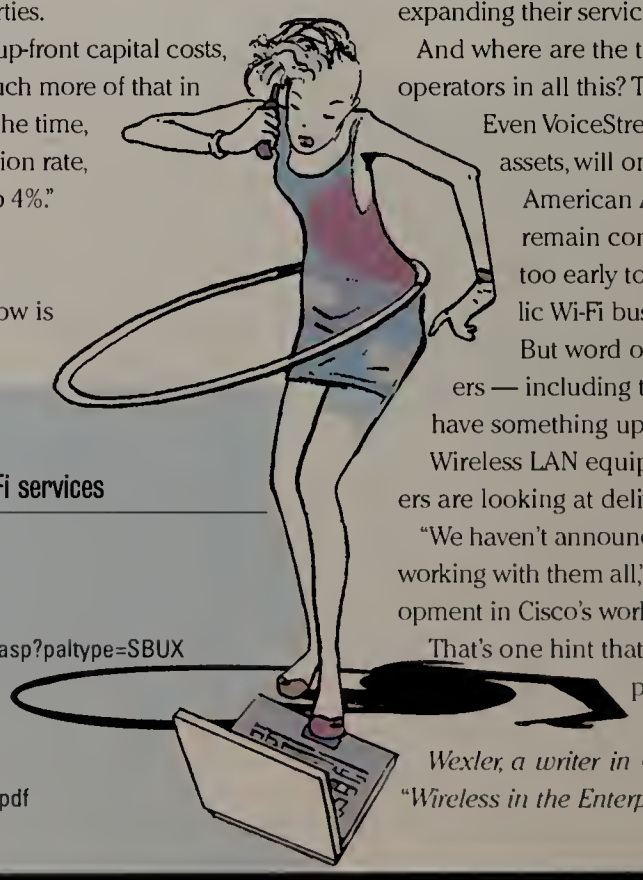
But word on the street is the big-name traditional carriers — including the likes of AT&T, WorldCom and Sprint — have something up their sleeves.

Wireless LAN equipment supplier Cisco says all the major carriers are looking at delivering wireless ISP services.

"We haven't announced formal relationships with any, but we are working with them all," says Kristine Stewart, director of market development in Cisco's worldwide marketing group.

That's one hint that, before you know it, your company's user population will be chanting for Wi-Fi support.

Wexler, a writer in Campbell, Calif., is author of Network World's *"Wireless in the Enterprise" e-newsletter — joanie@jwexler.com.*



Nationwide Wi-Fi locations

Airlines/airports

- AirTran Airways (boarding areas): 6
- American Airlines (Admirals Club): 14
- Austin-Bergstrom International Airport, Texas (most public areas)
- Chicago O'Hare International Airport (most public areas)
- Dallas/Fort Worth International Airport (most public areas)
- Seattle-Tacoma International Airport (most public areas)

Hotels and convention centers

- Doubletree: 8
- Four Seasons: 29
- Hilton: 39
- Marriot: 14
- Radisson: 29
- Seagate Convention Center: 1 (Toledo, Ohio)
- Sheraton: 18
- Sierra: 17
- Summerfield Suites: 36
- Wyndham: 70

Cafés, coffee shops and restaurants

- Properties in Arizona, California, Florida, Oklahoma, Utah and Mexico: 46
- Starbucks Coffee: 500

Find a hot spot

These URLs will help you locate Wi-Fi services

Unified Wi-Fi directory
www.Wi-Finder.com
Wi-Fi-enabled Starbucks stores:
www.mobilestar.net/locations/page6a.asp?paltype=SBUX
All Surf and Sip locations:
www.surfandsip.com/location_all.htm
All Wayport locations:
www.wayport.com/WayportFactSheet.pdf



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Wi-fi guide

A practical guide to deploying wireless Ethernet.

■ BY JOHN COX

Wi-Fi wireless LANs are deceptively easy to install. In fact, you might already have some.

"Users are installing these on their own," says Guy Denton, executive principal with IBM's Global Center of Competency. "We do security audits and find numerous wireless access points that the company knows nothing about."

The simplicity, however, masks an array of critical issues. "We often get called into projects after the fact," when clients run into unexpected problems, says Joe Musgrave, vice president with Signa Services, a wireless LAN consulting company in Erlanger, Ky. Users who aren't getting the bandwidth they expected, for example, might add more access points only to see bandwidth plummet.

Rolling out Wi-Fi LANs — products that meet interoperability tests spelled out by the Wireless Ethernet Compatibility Association — requires careful planning, a thorough security analysis, in-depth network design, and knowledge of products and evolving standards.

Easy? Well, not if you want to do it right.

Initial requirements

Presuming there is a call to add wireless support — workers that want to bring laptops to conference rooms, the cafeteria or other offices, for example — a good place to start is your local wired network, says E.J. von Schaumburg, CEO of InvisiNet, a wireless LAN installer. By examining your wired network you will see traffic patterns and bandwidth demand typical of the user population. After all, the wireless network will be an extension of the existing network.

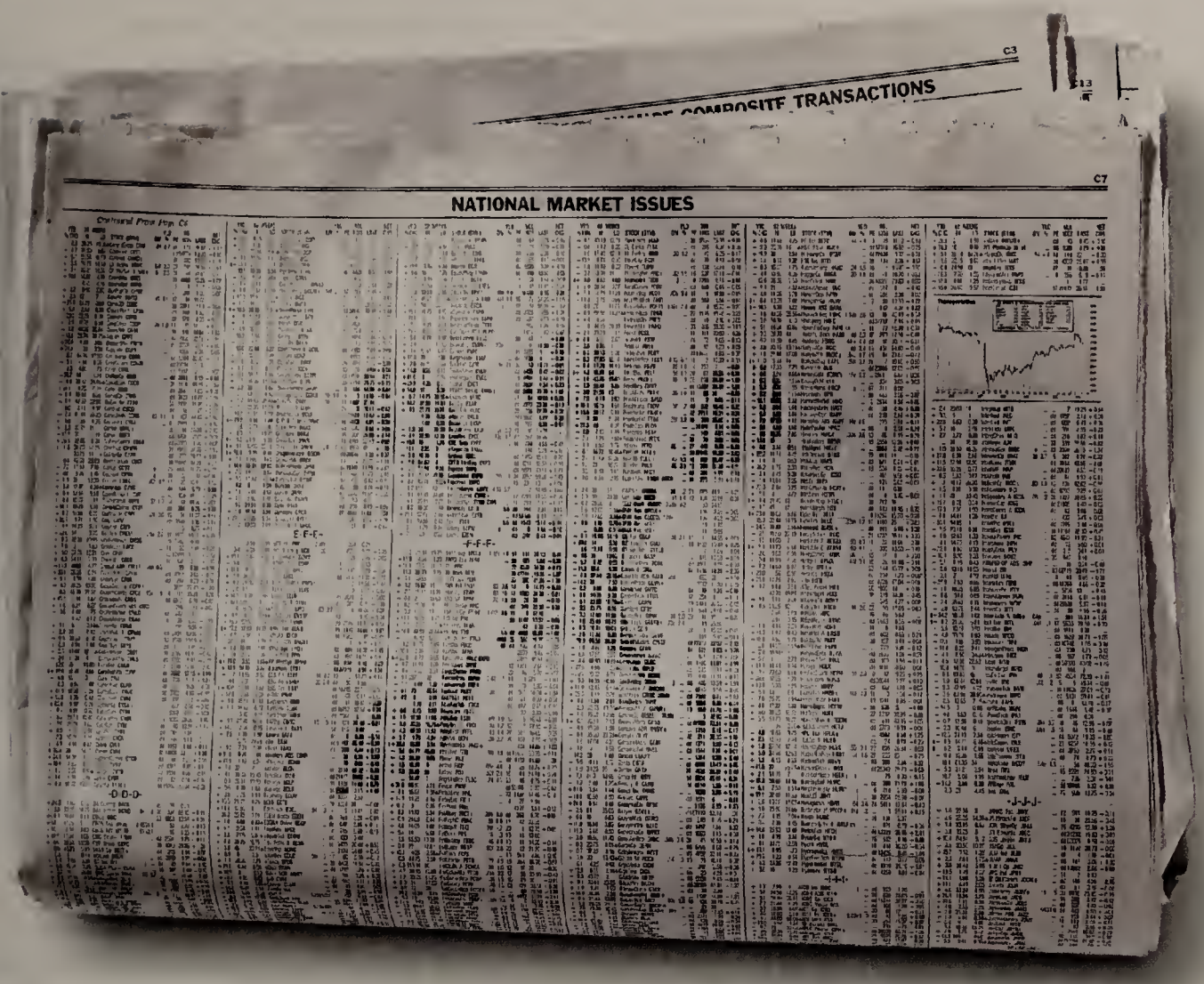
Based on this review, you can start to estimate what throughput, coverage and security you'll need for a given set of applications, Musgrave says.

These considerations, in turn, guide planners through the process of evaluating different wireless interface cards and access points.

The expertise to handle such evaluations varies widely. At BMW Group, which has 200 802.11b Wi-Fi access points at plants in Munich, the IT staff handles the process with help from equipment vendors and some outside support staff, says Daniel Lange, IT strategist with BMW.

Currently, the decision to go wireless, he says, is made on a case-by-case basis, weighing business needs at a given site against criteria such as security and costs. Later this year





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BMW will formalize a process that will help business users evaluate the need for wireless before they formulate their IT requests, Lange says. In particular, the process will help users assess the emerging 802.11a technology, which supports a maximum speed of 54M bit/sec.

To help users through the Wi-Fi needs assessment phase, Signa has created a seven-page preproject information sheet covering details such as the size of the facility, building construction materials and number of users. "We often hear from IT managers, 'I never thought about those things,'" Musgrave says.

One thing often overlooked is that wireless LANs require wiring: Wired Ethernet jacks may have to be installed so access points can be attached to the corporate LAN. And electrical power outlets may be needed for the access points, though some vendors offer the option of powering the access devices over Category 5 cable.

Wireless everywhere?

While wireless offers obvious utility in warehouses and other wide open spaces, there is disagreement about whether wireless LANs are suitable for general office environments.

At BMW, such deployments are discouraged because of the limited 802.11b bandwidth, about 5M to 6M bit/sec, and because of security concerns. "We do not consider 802.11b to be a drop-in replacement for wired infrastructure," Lange says. Some corporations limit wireless to conference rooms or other semipublic areas, relying on the wired net for day-to-day use.

But Federal Express is deploying wireless throughout two campuses at headquarters in Memphis, treating it as an extension of the corporate net.

FedEx workers have come to expect the convenience of wireless access, according to Ken Pasley, directory of wireless development at the company. If a group gathers for a meeting in one location that doesn't have wireless coverage, they'll move until they find it, he says.

One potential gotcha: Because of the limited bandwidth, Pasley says you have to watch out for large file downloads, such as CAD/CAM drawings. "You'd have to look at those closely," he says. But Signa's Musgrave says that even at 5M bit/sec, wireless LANs can support a range of business applications, including enterprise resource planning and PowerPoint.

FedEx started using wireless LANs five years ago, mainly in package sorting and aircraft maintenance areas. With the shift from those early proprietary LANs to 802.11b, which doubled bandwidth to 11M bit/sec, the company saw a 30% jump in productivity at the package sorting centers, Pasley says.

Security

Although security often comes up later in network design, it has to be considered early with wireless because of the inherent vulnerabilities. Wireless LANs are, by definition, not secure: Data is broadcast through the air and is hard to contain. The original encryption scheme for 802.11, called Wired Equivalent Privacy (WEP), is known to have several inherent weaknesses (see related story, page 17).

Given that, wireless security is a blend of art and science. "You should know what the vulnerabilities are and do what you can within reason to mitigate them," says Dennis Moule, information systems manager for carrier software vendor CoManage. "You make reasonable, sensible precautions to minimize risks. . . . And keep current with the emerging risks and how these might affect the equation."

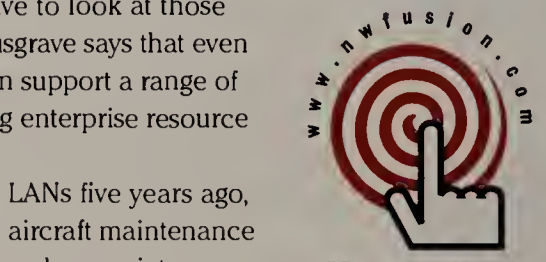


Depending on the requirements, security can range from turning on the basic WEP encryption, to full-blown authentication and encryption via VPNs tied into RADIUS servers. One Canadian integrator reports that many of his wireless customers say their data has almost no value to anyone outside the company, so security is not a priority for them.

But that's a deliberate decision. Many users don't seem to realize that the default security level for most wireless LAN equipment is zero. "I've been doing research on companies that have wireless nets and it appears the majority don't turn on [WEP] encryption, leaving their nets completely open," says Vincent , head network engineer for LANocracy, a wireless LAN installer.

"We assume that there is no security, that the wireless access point is an open, public Ethernet jack," says Christopher Hertel, network design engineer with the University of Minnesota's office of IT. The university treats the wireless LAN as if it were a public Internet, putting a firewall between the LAN and the wired net, and using a campus VPN and authentication via an X.500 directory.

This configuration is increasingly common, but it comes with a number of trade-offs. Administration becomes more complicated, requiring the distribution and updates of VPN client software to thousands of devices. There may be a lack of VPN



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clients for some operating systems. You have to build a separate wired infrastructure linking access points on the other side of the firewall. And destination addresses are limited to the VPN gate servers.

A related but obscure issue is that most employees with wireless laptops don't realize their wireless cards remain active, even if they're not using the VPN. It's possible for an attacker to use that active link to jump a worker's laptop and infect it with a virus or other malicious code, which is transmitted to the corporate network via the VPN when the worker logs on.

For its part, CoManage uses basic security steps: 128-bit WEP encryption, obscure network names, a clear prohibition on hooking up access points without talking to the IS department and periodic efforts to crack its own net using programs such as WEP Crack, Airsnort and Netstumbler. Moul plans to use the improved WEP Plus when his vendor upgrades access points and network interface card (NIC) software. At some point, as attacks become more common, CoManage will adopt a firewall/VPN model.

Site survey

The actual LAN design — how many access points are placed — draws on all this data and research, and hinges on several factors: the type of materials used in building construction and furnishings, the number of users in a given area and whether that number changes, and the throughput those users need. The larger the deployment and the more demanding the applications, the more complicated the equation becomes.

Signa uses a blend of off-the-shelf programs, such as AutoCAD and Visio, with their own list of wireless parameters when they reach the design phase. They enter data on the site dimensions, wall materials and other variables, and create a three-dimensional model showing an initial placement for the access points. But this model is always augmented with an on-site survey.

Most corporations don't have the expertise of Signa's designers. However, they can use handheld spectrum analyzers to detect radio interference and the same laptop applications many wireless LAN vendors offer for the site survey. You plug in an access point, then walk around with a wireless laptop and the programs show signal strength and throughput at different locations and different distances.

If you're doing this design work yourself, watch out for a common mistake: using one brand of interface card and access point for the initial design then a different brand in the final deployment. Doing so can lead to surprises stemming from different radio-frequency propagation characteristics, which leads to dead spots and lower bandwidth.

One consideration sometimes overlooked is aesthetics: do you want the access points to be visible or hidden behind ceiling tiles? And then there's the basketball factor: FedEx had to raise the access points in its sorting bays higher off the ground because college-age part-timers were leaping up and slapping at them to practice slam-dunks.

The site survey is essential for dealing with one of the most confusing design issues: 802.11b access points have a maximum of three nonoverlapping channels for users. Too many access points, haphazardly placed, will overlap these channels and users will see a serious drop in performance because of contention for the channel. Proper channel configuration can let you stack three access points atop each other giving users maximum available bandwidth.

The just-emerging 802.11a products have eight indoor channels and four more for outdoors, which means that more access points can be packed into the same area, to support more users at higher bandwidth — and, for now, at a higher cost compared with 802.11b LANs.

In theory, the higher bandwidth of 11a means the radios cover less distance, so two to four times more 11a access points will be needed to cover the same area as with 11b. But this will vary greatly by site.



From B to A?

Most corporations seem to be going with 802.11b installations while planning to pilot 802.11a down the road. FedEx is sticking with 802.11b, with no plans to use 802.11a or 802.11g. The latter boosts 802.11b speeds to nearly 54M bit/sec but uses the same radio frequency band as 802.11b — 2.4 GHz.

One popular configuration that's emerging is using 802.11b to create blanket site coverage at a maximum usable bandwidth of 4.5M to 6M byte/sec, with an eye to using 802.11a products to create higher-bandwidth "hot spots" for select users or applications. Some vendors offer access points with two card slots so customers can add 802.11a when needed. One company, Symbol Technologies, will let customers snap on 802.11a access points to existing 802.11b products, so the former can use the power and network management features of the "host" access point.

There's no shortage of vendors for wireless access points and NICs. They range from inexpensive 802.11b products that require minimal configuration and offer limited opportunity for customization, to premium-priced "enterprise-class"



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devices. Enterprise access points, for example, may have metal covers, special seals for harsh environments, network management software, an advanced Web-based user interface for administrators, a range of specialized software and a battery of proprietary features. These vendor-exclusive features might include support of higher bandwidths using proprietary techniques that the IEEE standard does not cover.

These "vendor exclusives" can frustrate interoperability. But experts and experienced users agree that a number of other factors can also render systems incompatible. One is software: drivers available for one brand of network cards may not work with another brand of access points. Or a given may not vendor support the drivers you need.

This stew of variables is so complex that Signa's designers have created a chart that details the different features and performance characteristics of access points and interface cards. In some locations, a specialized antenna may be needed to "shape" and direct the radio transmission. In that case, the access point must be able to accept an external antenna.

The equipment criteria are established by blending data from phase 1, the initial requirements process, and phase 2, the site survey.

"You have to distinguish between what are features of the [802.11b] standard for interoperability and what are vendor proprietary 'standards,'" says Tiberio Massaro, Signa's professional services marketing manager. Then, network executives can make decisions knowing the trade-offs.

Deployment

It's a relief that most users and integrators agree that deployment of a properly surveyed and designed wireless LAN is pretty straightforward.

Experts recommend staging the equipment first — create the network names and identification databases, load the net information into the access points, burn in the IP addresses and test everything.

You know where the access points are going, and what interface cards are being installed in which clients. It's a matter of pulling the needed cables for the access points, possibly adding some power outlets and attaching the access points.

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But details remain. If you have outdoor units, these need to be properly enclosed and grounded. LANocracy's Gullotta recommends always following the manufacturer's instructions. "For whatever reason, I've found that wireless LAN installations go much more smoothly if you follow these exactly," he says.

One of the final steps is to test the installed LAN thoroughly, at all levels, checking security policies, throughput and coverage.

There will be ongoing adjustments. FedEx employees piled equipment around one access point and network performance dropped. New shelving, new walls and shifts in inventory all can affect FedEx's throughput.

When an access point "hangs," for whatever reason, and simply stops working, it can create a more serious, hidden problem, IBM's Denton cautions. To get the device working again, you can shut off power and then turn it back on, or do a reset.

"But a reset clears out the security protocols," Denton says. "It can make a secure access point totally insecure, and no one will know the difference unless they specifically check."

User training must take into account everything from these serious security issues to the more mundane idea of teaching people that moving their wireless clients a foot or two might improve throughput drastically.

Such is the state of Wi-Fi: As easy as it to get a wireless network up and running, doing it right takes as much upfront planning and more ongoing diligence than your traditional wired networks. ■

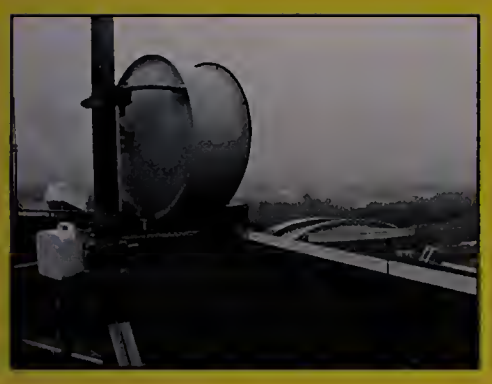


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Bob Egan, a 30-year IBM veteran, is a manager in IBM Global Services. He drives from his home in the mountain suburbs to IBM's Salt Lake City office with his ThinkPad in tow. Nothing unusual in that. But when he arrives, he won't know where he'll work, and the office, which a few years ago spanned four floors of a five-story building, now occupies just half of one.

Egan is an IBM mobile employee, one of the 30% of IBM's nearly 315,300 worker's worldwide without dedicated office space, working either from home, an IBM mobility center or a customer site.

Today, there are 252 mobility and "touch down" centers in 170 countries serving the IBM mobile community. Mobility centers are offices to which mobile workers are assigned and are concentrated in the U.S., Europe and Latin America. By contrast, touch down centers, concentrated in Asia Pacific and Europe, are used on a drop-in basis. Both types have between 20 and 200 desks and are open to IBM employees or visitors.

IBM introduced its global mobility program in 1994 as part of a corporate cost-cutting effort that also included layoffs. "We were going through a huge change. We had just brought in Lou Gerstner [as CEO], and he was dead set on us getting closer to the customer, saving costs and being more productive," Egan says.

Initially the program targeted sales and marketing executives to encourage them to spend more time in the field with customers. But IBM extended it in 1996 to product, project and program managers, providing workers ThinkPads, cell phones, pagers and training, says Jim Holden, program manager of IBM's global mobility, wireless and unified messaging initiative.

The biggest cost savings has been in real estate expenses, which IBM has cut by $100 million. Between 1996 and 2001, Big Blue downsized its facilities by 19% (including manufacturing plants), while increasing the number of workers in its facilities (including non-IBM workers such as security personnel) by 35%.

When Egan arrives at the Salt Lake City mobility center, he inputs his employee information, length of stay and office preferences into FlexiMove, an IBM-developed stand-alone reservation system. Settling in, Egan plugs his ThinkPad laptop into the office's Token Ring network or an analog dial-up line to access the corporate network, and programs the telephone system to forward all his incoming calls to the phone on his new desk.

In the early days, IBM modified the reservation system to prohibit "desk hugging," reserving the same desk for weeks on end. "We had to enforce a policy that you couldn't make advanced reservations, and there would be automatic sign out after the time you had reserved," he says.

But eight years into the program, Egan says desk-huggers are dated as increasing numbers choose instead to work from home, accessing the IBM network over a secure broadband connection. Egan himself commutes to the Salt Lake City office only about two or three days per month, and Holden says mobility center capacities have dipped to 40% in the U.S.

Even so, IBM plans to increase the number of centers overseas, in part to address the lack of broadband access, cultural issues and space constrictions in the home. But the company plans to re-evaluate the space dedicated to some existing U.S. centers when the buildings' leases are up for renewal, and will likely adjust the ratio of workspaces per mobile employee from 1-to-5 to 1-to-8.

IBM also plans to upgrade the reservation system next year and bring it online so that people can prereserve space through the company's intranet.

"We would like to manage multiple physical locations from a network-based server to simplify administration and support, and integrate other functions in a new system, such as the ability to schedule conference rooms, reserve audio/visual equipment, and even order food/beverage items from on-site providers," Holden says. "We also want to dynamically update the [reservation system's] database, and integrate it with our [intranet-based] employee directory."

Holden advises firms evaluating mobility programs to invest in laptops, a follow-me phone system and training. Today, employees are given mobility training manuals on disks, but IBM plans to develop a Web-based training program.

Egan says IBM could have done a better job training remote managers. "The management style of the 1990s was to manage by wandering around looking over people's shoulders. All of a sudden, you wandered out of your office and no one's there," he says. ■

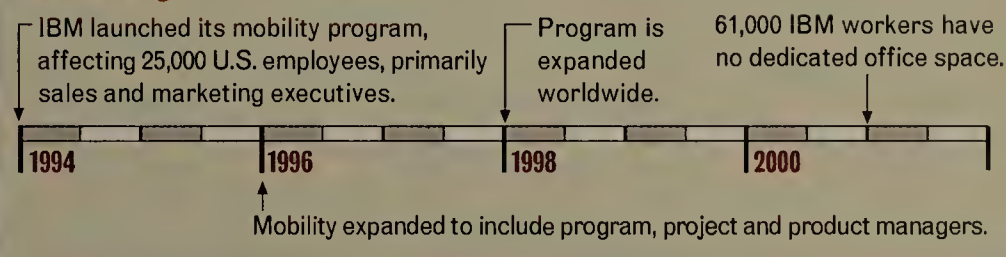
New World Order

IBM's mobility program spans four continents, letting 315,300 worldwide employees work in mobility centers, at home and in customer sites.

The story in 2002:
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23,000 work at customer locations.
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46,000 employees in Asia Pacific; 20% are mobile.
18,000 employees in Canada; 18% are mobile.
9,300 employees in Latin America; 15% are mobile.
7 out of 10 managers at IBM manage at least one remote employee.

Statistics are based on results of an employee survey conducted in summer 2001.

Mobility on the move



Short Takes

■ **3Com** announced today **Office-Connect Cable/DSL Secure Gateway** for small businesses. The device connects to a DSL or cable modem and contains an integrated switch with four 10/100M bit/sec Ethernet LAN ports. Security includes network address translation, and a stateful packet inspection firewall. VPN support includes Point-to-Point Tunneling Protocol and IP Security passthrough, PPTP tunnel termination and IPSec tunnel generation and termination for up to 10 simultaneous connections. The gateway will cost $350 and be available next month. **www.3com.com**

■ **Connected Corporation** today announced **Connected TLM for Small Business Service.** Similar to the enterprise offering Connected TLM 6.1, the new product includes the ability to back up and retrieve files and applications on individual PCs; a self-healing feature that cures application, registry and system configuration problems; and iRoam, for accessing PC data stored on the secure Connected Web site via a Web browser. Pricing starts at $17.95 per month for five users. **www.connected.com**



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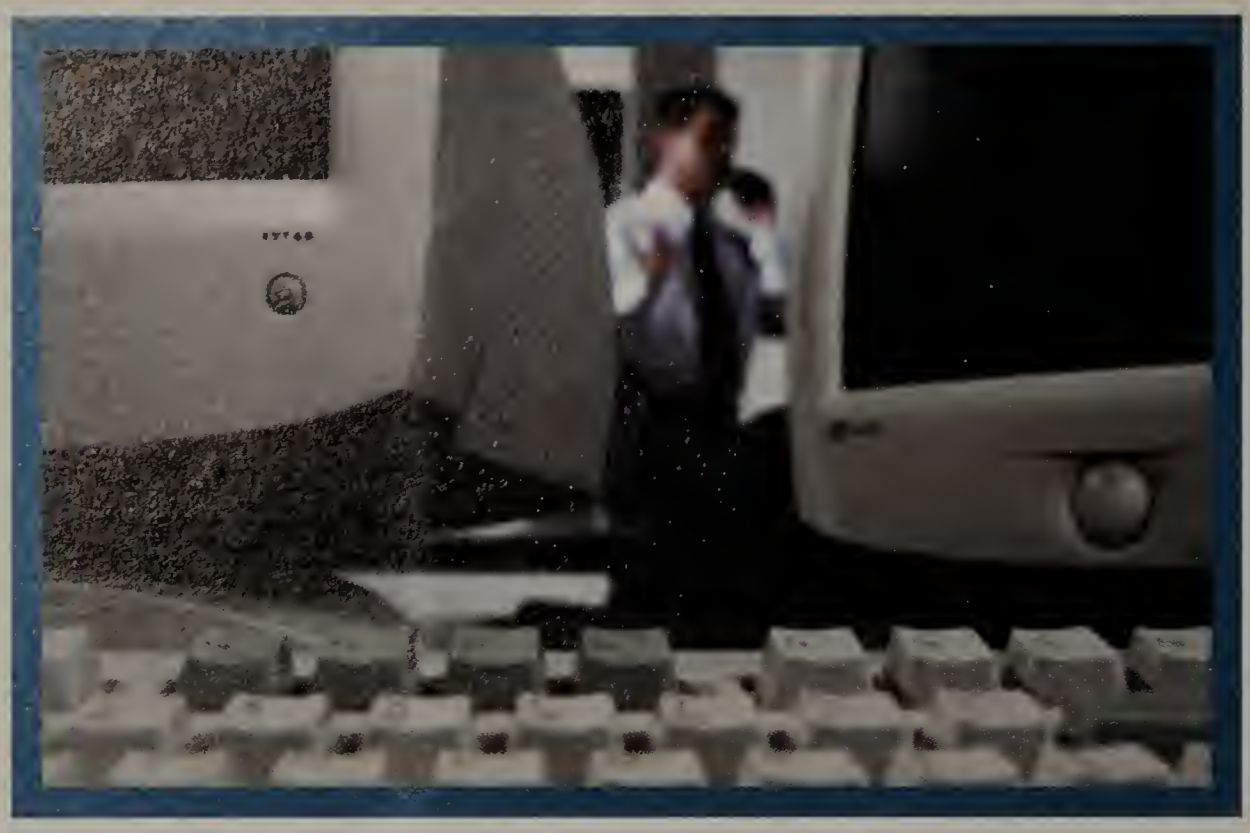
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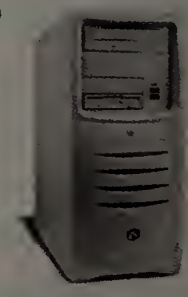
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In Site: Lessons from Leading Users

Speeding down the voice track

■ BY ELLEN MESSMER

Union Pacific, the largest rail system in North America, has installed a high-security speech-recognition system that corporate customers, such as The Home Depot, Monsanto and Dow Chemical, are using to schedule rail car movement in and out of train yards.

The first of its kind for e-commerce in the train industry, the speech-recognition system converts voice-based requests phoned in by the railroad company's customers and converts this spoken information into Web text, automatically updating Union Pacific's Web server of rail car information. The speech-to-Web application also has a "voice biometrics" security feature to check the caller's voice pattern against a digital voice sample stored in the so-called speaker verification database. IT managers at Union Pacific say the application, based on SpeechWorks' SpeechSecure, is much safer than phoning in rail car scheduling information to Union Pacific's call center.

Voice biometrics makes faking the identity of a legitimate person for purposes of sabotage "impossible," says Paul McGee, Union Pacific's senior manager of IS. "You'd have to be holding him hostage."

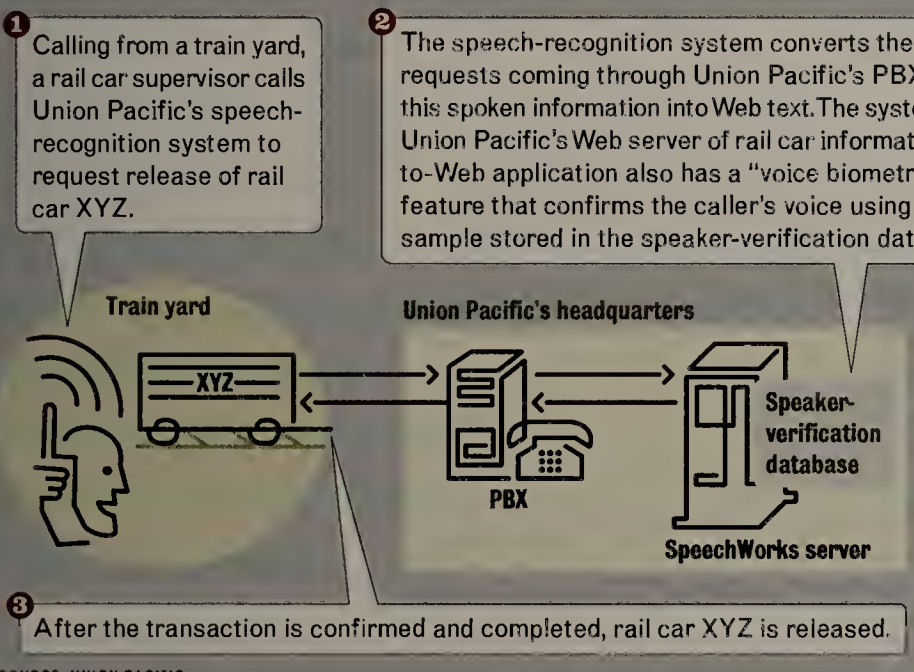
With heightened security concerns following the Sept. 11 terrorist attacks, the IT department found Union Pacific upper management very responsive to the idea of adding the voice-to-Web application as an alternative to the traditional method of phoning in rail car scheduling requests to a call center. About 500 of Union Pacific's largest customers have started using it to schedule movement of about 1,500 rail cars per week.

"We're shipping hazardous materials

See Voice, page 26

This is one way to run a railroad

Union Pacific has installed a state-of-the-art, secure speech-recognition system that customers can use to schedule product shipments through the railroad's rail car system.



SOURCE: UNION PACIFIC

Short Takes

■ **Oracle** said last week it will release a version of its **9i** database software for IBM mainframe Linux environments in mid-year. Developer releases of the Oracle 9i database for Linux for S/390 and zSeries mainframe servers from IBM are available for free download on Oracle's Technology Network service. The evaluation software comes in 31- and 64-bit versions, as will the production versions of the database software. Oracle says there have been more than 1,000 downloads of the evaluation software. www.oracle.com

■ **Microsoft** has found a partner in its efforts to recruit enterprise customers to embrace its single-sign-on service Passport behind the corporate firewall. **OpenNetwork Technologies** said last week it will retool its **DirectorySmart** product later this year so companies that use the software for authenticating users in a network will also be able to sign on automatically to any application or Web site that supports Microsoft's Passport authentication service. The software manages the identity of users and sets policies for what they can access based on certain credentials. www.opennetwork

Vendor brings collaboration to Excel users

■ BY JOHN FONTANA

HOUSTON — Advanced Reality this week will release collaboration software that plugs into Microsoft's Excel and lets users of that application share spreadsheet data from within the familiar interface.

Presence-AR Adapter for Microsoft Excel is an example of what experts are calling a contextual collaboration product, which lets teamwork features be plugged into applications. Current collaboration products require the deployment of a separate system to support group-sharing capabilities.

Contextual collaboration holds that users should stay in familiar application interfaces and not have to call up a separate program to work in partnership. It also alleviates the need for training and deployment of new applications.

Lotus and Microsoft are working on the same concept with the features of their products. And Groove Networks is developing support for Excel and Microsoft Word in its product.

"With Advanced Reality, our idea exchange is much more fluid because everyone can see the changes being made," says David Bonner, global director of technology for Rohm and Haas, a global chemicals manufacturer in Philadelphia. "Now we can work collaboratively and we completely avoid the training aspect because we stay in Excel." Rohm and Haas has a data capturing and sharing process, but Bonner says changes currently have to be made offline. Bonner also plans to use the adapter for Microsoft Word that Advanced Reality is developing.

The Java-based Presence-AR Adapter plugs into Excel along with Presence AR, software to facilitate connections using a peer-to-peer connection. Unlike application sharing programs that leave one user in control of one interface, Presence extracts the data and uses the application interface merely as a viewer.

When Presence AR Adapter is loaded into Excel it creates a "Begin Collaboration" button on the toolbar. When the button is clicked, users see a list of existing documents they can access, or they can create a new document. During a collaboration session, users can enter

See Collaboration, page 26

'NET INSIDER

Scott Bradner



Fights between things that never were

What an amazing concept! Take people for whom the Warholian 15 minutes of fame was about three times too long and set them up in a boxing event aimed squarely at the heart of the vast wasteland part of the TV dial. Who would have thought that anyone could outwrestle the World Wrestling Federation and Chia Pet infomercials for dominance of this critical part of our culture? Having Tonya Harding (of clubbing an opposing skater's knee fame) take on Paula Jones (renowned for being able to distinguish Presidential features) and call the result "Celebrity boxing" is a stroke of genius that is sadly not rare enough.

But it did get me to thinking of other things — even if they were only real in the gullible minds of the press and professional pundits or in the random number generators of the analyst companies — that could be paired up for imaginary boxing matches that would be at least as interesting or have the same level of lasting importance as celebrity boxing.

My first match would be between Fred "Ethernet killer" ATM-to-the-desktop and Charlie "IP killer" Novell IPX. This battle between ex-pretenders (in both senses of the word) to well-established kingdoms pits two accomplished money sinks against each other. The winner of this fight would get to take on Lou "Pure Blue" Token Ring, once the darling of the business world and now a fading memory.

The second match would feature Ellen "QoS Jr." APPN and Mary "I'm official" OSI protocol suite. APPN, once the heir apparent to the original "Mr. QoS" (IBM's mighty SNA), would come out of retirement just for this match. The OSI protocol suite, last seen in requests for proposals from the U.S. Federal Aviation Administration, was once world famous as the technology that governments loved to love, but now is seen mostly in network theory classes. This would be a fight to the death, if the contenders were not already effectively dead.

The highlight of the show would be a tag-team event with four of the biggest lights of the Internet boom era. Team Irrational would include the Pets.com sock puppet, representing the dozens of business-to-consumer ventures that thought Super Bowl ads could replace rational business models, and Joe "Bell Beater" CLEC, fronting for all those who thought that playing to the stupidity of the incumbent telephone companies was a license to print money. This fine team would face Team Exuberance, consisting of "Ms. Walled Garden" WAP, still pretending that a part of something that looks sort of like the Internet is better than the 'Net itself, and Billy "I'll do it for you" ASP, whose future depended on fast networks and expensive disks. This bout would be all the more interesting because most of the players have not figured out the state they are actually in.

Well, that was fun, and only disappointing in the number of well-qualified candidates for inclusion that had to be dropped for lack of space.

Disclaimer: Harvard does not think this low, so it must be me.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sob co.com.

Site: Lessons from Leading Users

Voice

continued from page 25

and military supplies," McGee says. "So security is important."

Union Pacific, which won't disclose the cost for the voice-recognition project, says factors other than security were also important in driving the decision to use speech-to-Web technology.

It's a more efficient way to have rail car supervisors in the field phone in their instructions on what rail cars they want to have available for loading goods or sent to a destination point. The speech-to-Web system banishes the commonplace errors — which have expensive consequences in misdirected rail cars — that are made at call centers when call service representatives are listening to instructions over the phone and keying it into a computer, McGee says.

Union Pacific's first wave of customers using it say they have found it easy to use.

"It works great," says John Buchmann, distribution center manager for The Home Depot in San Antonio, Texas, who oversees rail car unloading. "It also faxes a confirmation of everything you've said after it's done." The speech recognition's machine voice repeats back the rail car information given to it and asks if it's correct.

"We do 130 cars a month," says Buchmann, adding he likes the voice biometrics security. "No other associates working with you can say your password because the password is linked to your voice."

How it works

After authorized personnel authenticate identity through voice biometrics, they speak the alphanumeric rail car numbers along with instructions for their release. The SpeechWorks' application repeats it back for accuracy, and then converts the digital voice message to text to update the Union Pacific Web server, which runs a proprietary application called Car Release. Rail cars don't move until the customer has given the instruction to do so.

Customers can also input rail car instructions directly into the Union Pacific Web server over the Internet, but this is not always possible for distribution supervisors when they are out in the rail yard all day.

"The real target for this speech-recognition system is the group sitting on the dock that doesn't have Web access," says Union Pacific's director of e-commerce, Charlie Duckworth.

Information, converted from speech to text, is stored as HTML data in Union Pacific's Web server, which is also a front end for the corporate mainframe. Once the mainframe has the rail-car-related information, it will schedule a task for railroad personnel, such as pulling an empty rail car from a customer's loading dock so it can be available to pick up goods elsewhere.

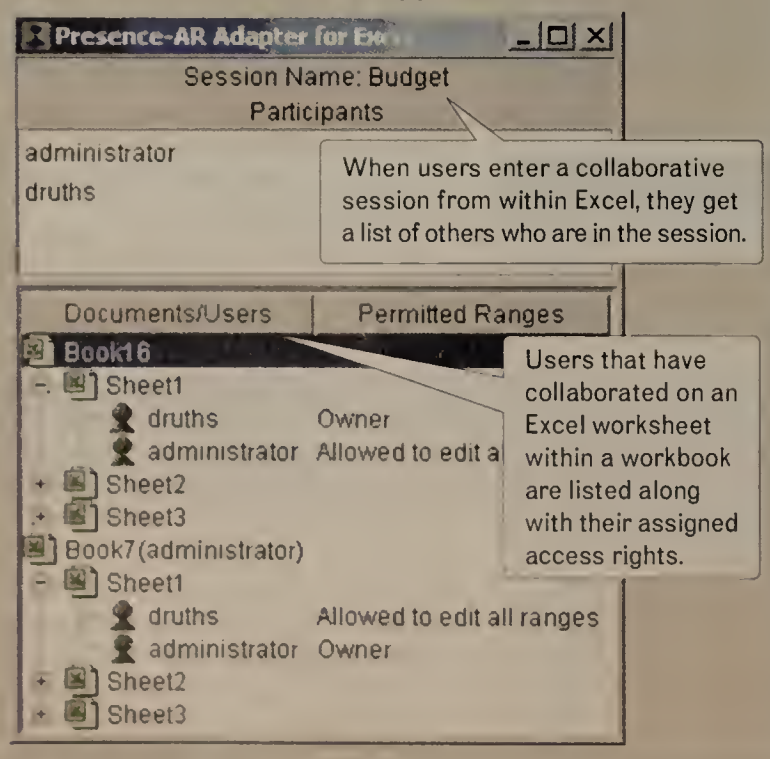
The rail-car-release information is important because it not only sends rail cars on their way, but it also automatically triggers mainframe-based invoicing and billing functions.

Union Pacific plans to expand its use of speech-to-text for use by truck drivers arriving at rail facilities to pick up goods, McGee says. "They'll speak their ID to validate who they are," McGee says.

The SpeechWorks-based system was chosen after a competitive bidding process in which SpeechWorks and competitor Nuance faced off. While there wasn't much difference in the prices, according to McGee, the deciding factor was perceived ease of integration with Union Pacific's Web server. ■

Team work

Advanced Reality is releasing software that lets Microsoft Excel users share data over a peer-to-peer connection from within a spreadsheet application.



Collaboration

continued from page 25

or edit data and formulas; cut, copy, paste and drag-and-drop cells; and create and add new workbooks. Connections between peers are encrypted using Secure Sockets Layer, and users who create the documents can regulate access to entire documents or fields of data using passwords, digital certificates or token cards. Companies can set up a central file system to store spreadsheet data, or spreadsheets can be stored on desktops.

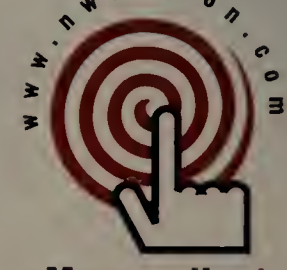
"It's a very fluid use of collaboration," says Tyler McDaniel, an analyst with Hurwitz Group. "It's one of those things that can make a daily impact on data sharing and ensure that everyone is up to speed. This is a good departmental application."

The software also shows a history of changes when the mouse pointer is placed over a cell. A SQL database also can be used to record and audit changes. The software includes a lightweight Java-based directory that runs on the network and lets Presence users find and establish peer connections.

Advanced Reality plans to add support for Lightweight Directory Access Protocol.

The software is available now and costs $50,000 for a site license, which allows unlimited users.

Advanced Reality: www.advancedreality.com



More online!

Analysts following biometrics say that while products are improving, shortcomings remain.

DocFinder: 8635



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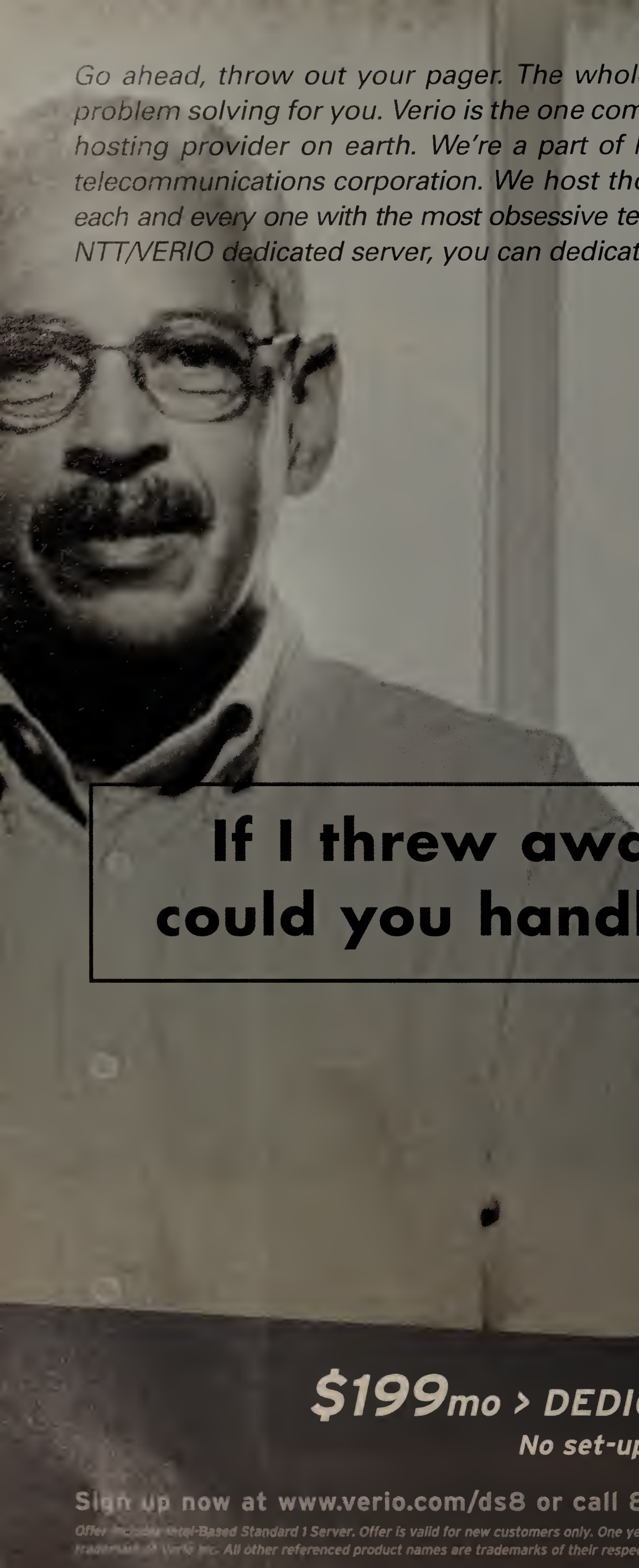
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ServiceProviders

■ THE INTERNET ■ EXTRANETS ■ INTEREXCHANGES AND LOCAL CARRIERS
■ WIRELESS ■ REGULATORY AFFAIRS

DSL provider MegaPath extends reach

■ BY MICHAEL MARTIN

Broadband provider MegaPath Networks revealed recently that it has signed partnership agreements with all four regional Bell operating companies, letting MegaPath offer enterprise customers a wider geographic reach.

MegaPath also has partnership arrangements with several competitive DSL providers.

Although MegaPath is a broadband provider, the company doesn't have any DSL access multiplexers. Instead, it buys wholesale DSL connections from partners and terminates them on its own IP switches located in central offices. MegaPath then routes that DSL traffic over its IP network.

MegaPath's value proposition to customers is that it offers a wider geographic reach than any single DSL provider, packaged with a service-level agreement and one point of contact, says Dan Foster, a senior vice president at MegaPath. The reach is a major benefit when going up against competitors such as AT&T and UUNET, he says.

Enterprise clients don't seem to be too concerned about which DSL technologies MegaPath uses to reach their offices, Foster says. MegaPath could wind up patching together a network using symmetrical DSL from Covad Communications for offices in some areas, and asymmetrical DSL from the RBOCs in other areas.

"As long as you can manage the service-level agreement, they tend to be happy," he says.

One such customer is RadioShack. The home electronics retailer relies on MegaPath to connect 2,400 of its stores across the country to customer and sales information stored on mainframes at the company's data center. The connections also help RadioShack showcase its Microsoft MSN Internet Access service in-store for potential customers.

Thinking big

Some advantages MegaPath offers enterprise broadband customers are:

- One point of contact for all a customer's distributed offices so network managers don't need to juggle contracts with multiple DSL providers.
- A service-level agreement covering all a customer's DSL lines, instead of a separate SLA for each provider.
- Companies can get value-added services such as static IP addresses, or managed VPN services.
- A range of partners, including Verizon, SBC, BellSouth, Qwest, Covad, Allegiance, New Edge and IP Communications.

RadioShack decided to go with MegaPath as its DSL provider at the recommendation of MSN, says Evelyn Follit, CIO of RadioShack. RadioShack previously relied on DSL provider NorthPoint Communications for its DSL connections, and the company was left scrambling for a new provider when NorthPoint declared bankruptcy and turned off its network in early 2001.

What RadioShack likes about its relationship with MegaPath is that there's only one point of contact for problem resolution and project management, Follit says.

While many DSL providers have gone out of business in the past year, Follit is confident MegaPath won't join the ranks of the bankrupt. MegaPath has backing from MSN, she adds.

"And as they add relationships with the incumbent carriers, we gain more confidence in them," she says.

While MegaPath's specialty is DSL, the company also offers traditional connections such as T-1 lines. The company has rolled out some IP VPNs in parts of the country and plans to roll out the service more broadly later this year.

MegaPath: www.megapath.com

Short Takes

■ Metropolitan-area network builder **Metromedia Fiber Network** last week said it will declare bankruptcy if it can't restructure its debt. Metromedia struggled with its $3.3 billion debt for several months and last week missed a $30 million interest payment owed to Verizon. The company has 30 days to negotiate with Verizon before it is considered to have defaulted on the payment. www.mfn.com

■ **NTT DoCoMo** expects to launch its **I-mode** wireless Internet service in the U.S. by midyear, CEO **Keiji Tachikawa** said last week at the Cellular Telecommunications and Internet Association conference. Plans for a U.S. entry began in 2000 when the company said it would partner with AT&T Wireless Services, then a subsidiary of AT&T, for wireless Internet and 3G services. In January 2001, the company took a 16% stake in AT&T Wireless. I-mode has about 31 million subscribers in Japan, and NTT DoCoMo rolled out I-mode service in Europe last week through partners such as the Dutch carrier **KPN Mobile.**

USi offers an enhanced SLA

■ BY JENNIFER MEARS

ANNAPOLIS, MD. — Application service provider USinternetworking is expanding its service-level agreements to guarantee an application's actual performance, as opposed to its simple delivery. Analysts say it is one of the first ASPs to widely offer such guarantees.

"This is one thing we've found that ASPs need to do to gain traction," says Christine Ferrusi Ross, an analyst at Forrester Research. "Basically, all the performance under the application won't make a difference if the application itself isn't running well."

Christopher Walker, a spokesman for USi, says the new SLA comes in response to customers who wanted the ASP to go beyond strictly 24-7 application availability. The performance-based SLA covers USi's hosted Microsoft Exchange 2000 service, but Walker says customers can expect the ASP to roll out performance-based guarantees for other applications. USi's hosted applications include software from Ariba, BroadVision, Lawson Software, Microsoft, Oracle, PeopleSoft and Siebel Systems.

"This in effect becomes the next generation of the SLA: the performance-based SLA that's focused on business process and not just availability," Walker says.

The performance-based guarantee is tailored for individual clients and their application needs. USi reviews application usage before designing the SLA for each customer. In the case of messaging, the performance SLA covers logon, send, receive and calendar lookup transactions. Each SLA is unique and varies according to each customer's needs, Walker says.

The way it works is that the ASP measures transaction response times between the USi data center and the customer premises, where the USi circuit ends, says Bill Webb, vice president of product management for USi. An average response time is determined, "and if any of the transaction averages exceed the thresholds, the SLA is considered missed," Webb says.

If that happens, the situation is corrected and the customer receives financial reimbursement, which appears as a reduced monthly fee the next month, Walker says.

As customers put more and more business process onto networks, the performance of the application will be paramount, says Donna Scott, vice president and research director at Gartner. She says more companies will demand performance guarantees.

"Although less than 15% of large enterprises measure the end-to-end availability and performance of critical applications today, we believe 75% will be doing so and measuring against predefined [SLAs] by year-end 2004," she says.

The performance-based SLA for hosted Exchange is available now.

USinternetworking: www.usi.net



More online!

Broadwing offers a new off-net SLA.

DocFinder: 8634

EYE ON THE CARRIERS
Johna Till Johnson



Crafting service-level agreements that work

There's good news and bad news on the topic of service-level agreements. The good news is that most large organizations have begun to define SLAs for all carrier service contracts — and they include items such as latency and availability that have a real impact on user satisfaction.

Even better, the carriers now are enthusiastically supporting these SLAs and even including them in their contracts without being asked.

The bad news is that in most cases there's no easy way to enforce them. Carriers have gotten used to contesting SLA-noncompliance claims, and when they do admit fault, they're more likely to write checks than to make lasting service improvements.

That doesn't help much. Telling the corner-office suits that you got a few months off next month's service charges doesn't win any brownie points when the real issue is poor service.

So what's a telecom manager to do? The answer is to craft SLAs that cause real pain — not merely the financial kind — in the service provider's organization. One of the clearest and most effective ways to do this is to craft a defined, escalation policy that ensures that any issues receive immediate attention from the right people inside the service provider's organization.

Here's how it works. First, define what constitutes a service "incident" to you and your users. Create severity tiers that characterize the impact of a service weakness. For example, outright service cessation — no dial tone, no packet transfer — is obviously tier 1.

But you also should consider latency spikes, which can affect user response-time. Sustained latency of 250 msec or more for periods of longer than 1 minute may constitute a tier-2 event.

Once you've defined the set of tiers, determine how quickly the carrier should inform you of an incident, how quickly it should respond to your notification and how quickly you can expect restored service.

After that, get the names, job descriptions and phone numbers for the individuals who will be directly responsible for repairs. Get the contact information for the individuals to whom they report. Then, define explicitly when the service provider will escalate an incident. The service provider should agree to inform you directly every time an incident has been escalated.

Now for the secret sauce: Explicitly specify that a senior member of management will address any issues that are not resolved in a timely fashion and to your complete satisfaction — at a time and date of your choosing.

In other words, if you are sufficiently unhappy, an executive vice president will fly out to your site to explain why your network doesn't work.

This works for a simple reason: Nobody wants to tell the vice president he has to exchange a Friday tee time for boardroom full of angry customers. The result is a more energetic effort to avoid the situation — exactly what you wanted in the first place.

Johnson is senior vice president and CTO for Greenwich Technology Partners, a network consulting and engineering firm. She can be reached at johna@greenwichtech.com.



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Special Focus

APPLICATION SERVICE PROVIDERS: Market struggles overshadow user success stories.

ASP customers hail return on investment

■ BY JENNIFER MEARS

Investment firm Frank Russell knew an application service provider could quickly deploy the company's human resources application, thus freeing its own IT team to focus on other projects. What Russell didn't know was that using an ASP would provide a 200% return on investment in just the first year, says Gene Johanson, senior manager of special projects.

"To tell you the truth, if we had ended up with a wash in the costs, that would have been just fine," says Johanson, who uses PeopleSoft's eCenter. "Getting this benefit on top of being able to get the project up quickly is icing on the cake."

Russell is one of dozens of companies that are reaping big benefits by using an ASP, a fact that may come as a surprise to network managers who are skeptical because of the long list of failures and financial problems these service providers have endured.

A study of 54 ASP customers in North America and Europe conducted by IDC last year found that on average those customers posted a 400% return on investment (ROI) during a five-year period. IDC measured ROI by looking at the cost of the application, hardware and maintenance, as well as identifying the business processes affected by the ASP implementation and gauging impact.

Why is the market getting a bad rap while customers gain efficiencies and cut costs? Amy Mizoras, an IDC analyst who co-authored the report, says that much of it has to do with the lofty expectations that surrounded the ASP market when it emerged. With ASP adoption happening much more slowly than expected, some service providers weren't able to build the customer base they needed to support big upfront investments and ended up closing their doors. As a result some deemed the ASP market a failure.

"What we found through our study is that's really not the case," Mizoras says. "It's almost like these customers are the silent participants in the ASP market. I don't think ASPs do a good enough job of getting the message out that they've got happy customers."

Not all is rosy with ASPs, however.

"Going down this path is still risky," says Terrie Brown, IT manager at lighting manufacturer Lumileds in San Jose. "I think the ASPs who are going to survive are still up for grabs."

At the same time, Brown says that the benefits of ASPs — quick time to market, low upfront costs, and oftentimes better application performance — outweigh the risks. What enterprise customers need to do, she says, is thoroughly research an ASP before signing up and make sure contracts give the customer an out if trouble strikes.

Brown initially used J.D. Edwards' JDe.sourcing application hosting service, but transitioned to J.D. Edwards' partner ASP Agilera when the software maker closed its direct ASP service. Agilera hosts J.D. Edwards' manufacturing, financials and distribution applications for Lumileds, a joint venture of Agilent Technologies and Philips Lighting.

"The benefits [of using an ASP] definitely outweigh the cost and time it would take to do it all myself," she says.

Because she wasn't replacing any in-house systems, Brown says it's hard to quantify the ROI she's getting. But as far as cost benefits go, she says it's a "no brainer" because with Agilera she gets access to application expertise she otherwise couldn't afford.

Ulrich Seif, CIO at National Semiconductor, which uses Qwest to host its SAP financials and human resources packages, also has some words of caution for his peers: understand exactly what it is you're handing off to an ASP or you could find additional expenses, rather than savings.

"What we made very clear is that we only outsource components of our operations that we understand very well because only then can we judge the costs [and the savings]," he says. "If you want to outsource a headache, you will fail because you're just trying to hand off a problem."

Seif says it took just six weeks to recoup the expense involved with moving to an ASP.

Another consideration for some potential ASP customers is lack of customization. For example, Berlitz GlobalNet, a global translation company, sacrificed some sophistication in its salesforce automation application by using Salesforce.com's hosted service.

"You're not able to use technology that you've developed as a competitive advantage because anyone could go and start using [the ASP]," says Kevin Sher, sales and marketing director for North America for Berlitz GlobalNet.

But competitive advantage was not important when it came to Berlitz GlobalNet's customer relationship management needs, he says. What was important was getting the application up quickly: It took three days to get online with Salesforce.com, he says. In addition, Sher says his firm saved at least $300,000 in the first year.

Others, such as Siemens, are finding ASPs can make business operations run more smoothly. Siemens Business Systems is using Portera's hosted professional services automation software to manage its Australian operations.

"There certainly have been a number of benefits, such as having centralized access to information," says Dominic O'Laughlin, Siemens Business Services Program office manager. "We've seen a lot more efficiencies coming through."

Tom Brockhaus, director of customer retention at Charter Communications, says he's already seeing value since he began using hosted sales process automation software from Salesnet in October.

"It didn't take much time to determine the cost benefit," he says. "How can you compare a monthly subscription fee to adding servers and appointing internal IT staff to support whatever application you're using?"

Brockhaus wouldn't be specific about cost savings, but Salesnet's monthly fees range between $49 and $95 per month.

Figuring ROI on ASP implementations, though, isn't as clear-cut as simply looking at technology costs, Mizoras says.

"There are a lot of other benefits. In fact, two-thirds of the benefits are actually related to business productivity and business process enhancement," she says, explaining that rapid deployment and performance improvements will boost ROI.

For example, Sterngold, a manufacturer and provider of dental materials, decided to use ASP Surebridge to host its e-commerce application, rather than handle the project in-house. As a result, Sterngold got its e-commerce site up faster than it would have on its own.

"They got all our information together, got it displayed properly, laid out Web sites, did the art work, did the network architecture, did the database architecture, got the systems in place — all in four months," says Gordon Craig, a Sterngold vice president. "It would have taken us two years to do something like that."

Craig says he expected to start seeing a return on the ASP investment in about two years. "But after about six to eight months of being up and running we were at a point where the site was paying for itself," he says. "We've hit our ROI [target]."

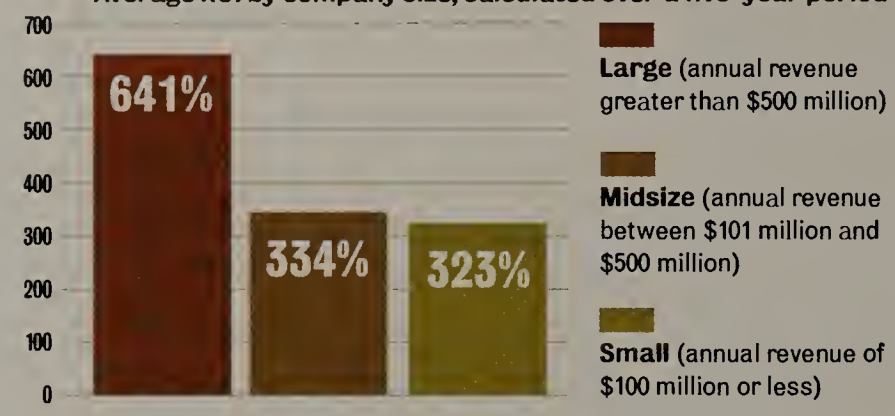
As for Russell's Johanson, he says he's avoiding more than $400,000 in costs annually by using PeopleSoft's eCenter. In addition, Johanson says that by moving from an old DOS-based system that was prone to crash to the hosted PeopleSoft application, his firm has seen an increase in productivity. In addition, the new application was up and running in three months. All this with very little strain on internal IT, which could focus on more important projects.

"The HR director said to me the other day, 'Boy, I'm glad we outsourced this,' " Johanson says. "That was probably the best payoff." ■

Reaping rewards

A study by IDC found more than just hype behind the ASP market:

Average ROI by company size, calculated over a five-year period



> **"If you want to outsource a headache, you will fail because you're just trying to hand off a problem."**
>
> **Ulrich Seif**
> CIO, National Semiconductor

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The Edge

■ SERVICE PROVIDER DEVELOPMENTS AT THE JUNCTURE BETWEEN THE ENTERPRISE AND THE NEW PUBLIC NETWORK

Juniper looks beyond core routers

Company taps new markets as backbone market share shrinks.

■ BY STEPHEN LAWSON

SUNNYVALE, CALIF. — Juniper Networks' plan to extend from the Internet backbone into new markets is an ambitious attempt to tap alternative sources of revenue as it faces an increasingly tough battle for market share in core routers.

The company was founded in 1996 with financial backing from several of Cisco's established competitors and a mission to take on Cisco's dominant Internet core routers with its own high-powered devices. The gamble has had some initial success: Juniper beat Cisco to market with a core router greater than 80G bit/sec of capacity and captured 94% market share with this class of product in 2000, according to Dell'Oro Group. In routers with between 10G bit/sec and 79G bit/sec of capacity, Juniper again started out fast, increasing market share from 15% in 1999 to 25% in 2001, according to Dell'Oro.

But Juniper's quarter-over-quarter share in this class of product has been dropping steadily, from a peak of 32.7% in the second quarter of 2001 to 23.2% in the fourth quarter. And in 80G bit/sec-class systems, Juniper surrendered half its market share to Cisco in 2001, Dell'Oro says, after Cisco began shipping 10G bit/sec OC-192c interfaces for its 12000 series Internet Routers.

Cisco also has leapfrogged Juniper in the "speeds-and-feeds" public relations contest. Cisco says its current high-end system, the 12416 Internet Router, has a total switching capacity of 320G bit/sec. That beats Juniper's fastest box, the 160G bit/sec M160, but Juniper is expected to unveil a 320G bit/sec-capable system later this year.

However, Juniper didn't wait for these recent warning signs before diversifying its product portfolio and target markets.

In 1999, the company began reworking some of its original technology to offer service-provider edge routers, a market that includes Juniper's 10G bit/sec to 79G bit/sec devices, and 1G bit/sec to 9G bit/sec systems.

In 1G bit/sec to 9G bit/sec routers, Juniper ranks third with 5.5% share in 2001, compared with Cisco's 82% and Unisphere Networks' 9% share, according to Dell'Oro.

Last year, Juniper formed a joint venture with Ericsson to develop routers to link mobile wireless infrastructures with IP data networks. And in November, Juniper acquired Pacific Broadband Communications and expanded into the cable modem termination system (CMTS) business, another Cisco stronghold.

The company explains its plan as a multipronged attack on network bottlenecks.

"The strategy of the company is to focus on problems of scale and reliability in building the new public infrastructure. One does not get [there] by focusing only on the core," says Pradeep Sindhu, CTO and founder of Juniper.

When Juniper was founded, the bottleneck in carrier networks was at the core. Now the core has been built out, and the systems at the edge need to be improved.

A plus for Juniper is that if those bottlenecks are cleared, traffic and demand for core routers will increase, Sindhu says.

Observers view Juniper's Pacific Broadband buyout not so much as an entry into the CMTS market as it is a strategy to sell more routers (see www.nwfusion.com, DocFinder: 8633). Juniper already missed one big CMTS opportunity last year when cable network operator Excite@Home went bankrupt, according to industry analyst Michael Harris, of Kinetic Strategies.

The collapse of Excite@Home forced several cable operators to build their own networks to replace its infrastructure.

However, Juniper's CMTS time may come once all the standards are in place for offering voice services over cable modems — probably about a year from now. Operators will dive in to upgrade their systems for these potentially lucrative services, Harris says.

Meanwhile, the company's mobile initiative through a joint venture called EJN Mobile IP, which is based in Boston, appears to be a bold move into a new product category. But it, too, should yield more core and edge router sales.

EJN's first gateway for mobile IP services brings together the functions of a General Packet Radio Service (GPRS) gateway with the Juniper M20 router. Called the AXB 250 06 Gateway GPRS Support Node (GGSN), it sets up data sessions for mobile customers and routes the packets they send and receive.

"The wireless world is getting more and more IP-based," says David Berndt, a wireless analyst at Gartner. "Juniper definitely has the background and the tools to take advantage of that evolution."

Some operators today use different backbones for different services, but the industry eventually is expected to converge on IP. Juniper is intent on selling more routers to these operators as the infrastructure to support their 3G mobile wireless services (DocFinder: 8632).

From core routers to edge routers to CMTS and GGSNs, Sindhu declined to speculate what Juniper's product lineup will look like in two years, but he says its new businesses are likely to show higher growth rates in the near term than its more mature core business. As for expansion into yet more sectors, Sindhu says the company has identified the key segments for its strategy for now.

"Because mobile and cable are expected to be fairly strong components of the telecom infrastructure, they're not something Juniper can ignore," Sindhu says.

Lawson is a correspondent with the IDG News Service's San Francisco bureau.

PROFILE: JUNIPER

Location:	Sunnyvale, Calif.
Founded:	1996
Products:	M Series core and edge routers; cable modem termination systems; router for mobile wireless IP networks.
Management:	Scott Kriens, CEO; Pradeep Sindhu, CTO.
Financing:	Initial investors included Kleiner, Perkins, Caufield & Byers; New Enterprise Associates; Benchmark Capital; Crosspoint Venture Partners; and Institutional Venture Partners.
Customers:	Cable & Wireless, Genuity, WorldCom, UUNET, Verio, Global Crossing, MFN-AboveNet, Qwest and Level 3.
Employees:	1,227
Fast fact:	Juniper received $40 million in funding from many large vendors that compete with Cisco, including Ericsson, Nortel, Siemens and 3Com.

Short Takes

■ **Lucent** and **Nortel** last week announced that they are involved in two **Verizon Wireless** trials. Lucent and Verizon Wireless will launch a 3G trial network in Washington, D.C. The data-optimized Code Division Multiple Access 2000 1xEV-DO network will provide businesses with mobile access to e-mail and intranets at speeds of up to 2.4M bit/sec, the companies say. Verizon Wireless offers data rates of 40K bit/sec to 60K bit/sec, burstable to 144K bit/sec, on its 1xRTT Express Network. Verizon Wireless is the first mobile network operator to deploy Lucent's new Flexent OneBTS base stations, announced in March. Separately, Verizon Wireless and Nortel will launch a similar trial in June in San Diego. The trial will use Nortel's Metro Cell base stations. The two companies also are working together to deploy CDMA20001xRTT radio base station equipment and related network gear for Verizon Wireless' Express Network. **www.lucent.com; www.nortelnetworks.com; www.verizonwireless.com**

■ Core ATM/MPLS switch maker **Equipe Communications** last week announced that optical powerhouse **Ciena** will invest in and exchange technology with them. Ciena's investment will range from $2 million to $5 million, sources say. Ciena did not disclose the amount of its investment. Ciena will be a new investor in Equipe's $40 million third round, which also was announced last week. Equipe recently cut 25 staffers to attract new funding. **www.equipecom.com**

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

802.1X provides user authentication

■ BY PAUL GORANSSON

Most end users connect to enterprise networks via a Category 5 wire to an Ethernet switch, but access via 802.11 wireless access points seems poised for rapid growth.

In this era of ever-increasing mobility in wired and wireless scenarios, we can no longer always assume a user's access to a Layer 2 network will be via the same physical port of entry. This mobility has created a need to identify who is attempting to gain access to a given port. The 802.1X standard provides such a solution.

802.1X defines Extensible Authentication Protocol (EAP) over LANs (EAPOL). The standard encapsulates and leverages much of EAP, which was defined for dial-up authentication with Point-to-Point Protocol in RFC 2284.

Beyond encapsulating EAP packets, the 802.1X standard also defines EAPOL messages that convey the shared key information critical for wireless security.

For the purpose of describing 802.1X, we use the term network access server for the box that provides a user's port of entry to a LAN and thus carries the responsibility for authenticating a client.

A network access server is usually an Ethernet switch or a wireless access point. Upon detecting the presence of a client, a network access server sends an EAPOL-encapsulated EAP request-ID to the client.

The client responds with an EAPOL-encapsulated EAP response-ID message containing the user's identification.

The access server then reencapsulates this same EAP response-ID message in a Remote Authentication Dial-In User Service access request packet and forwards this to a RADIUS server.

EAP messages are relayed between the client and RADIUS by the access server, on the client side encapsulated in EAPOL, and on the server side inside a RADIUS packet.

In the final step, the RADIUS server responds with a RADIUS access accept (or deny) packet containing an encapsulated EAP success (or failure), which the network access server then forwards to the client.

In the case of success, the port is considered opened for data traffic and the user authenticated.

However, a twist in the 802.1X protocol exchange may occur in a wireless environment when encryption is being used. There is some confusion in the user community about the role 802.1X plays in Wired Equivalent Privacy (WEP) encryption, and this is a topic of hot debate.

The simple answer is that if static keys are used for WEP encryption, 802.1X plays no direct role; once the port is authenticated, subsequent packets between client and wireless access point are encrypted using those static keys.

This static-key WEP encryption is widely held to be far too easy to crack, and 802.1X plays a direct role when dynamic session keys are used. In this case, the RADIUS access accept will include session keys, which are used by the wireless access point to build, sign and encrypt an EAPOL key message.

This is sent to the client immediately following the EAP success message. With this information, both client and wireless access point can program their encryption keys dynamically, making the encryption more difficult to crack.

Future

There are a number of emerging applications for 802.1X. High-end LAN switches often provide advanced capabilities such as quality of service and virtual LANs that could be automatically configured for a port based on the authenticated user. Another application is public access to the Internet via wireless LANs. An ISP offering such a service must be able to authenticate and bill for that public access.

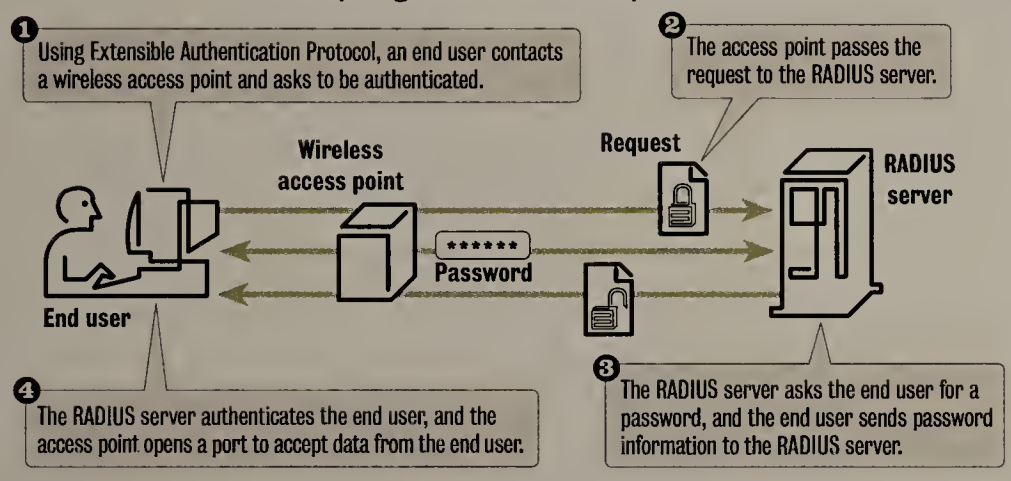
Because of the potential growth of this type of wireless LAN public access, it is no surprise that the IEEE committee focused on security issues in 802.11 wireless LANs (subgroup 802.11i) is discussing many improvements to 802.11 wireless access security. Since 802.1X remains at the core of these security mechanisms, we are likely to see additions and refinements in the use of 802.1X in wireless environments.

Goransson is president of Meetinghouse Data Communications. He can be reached at www.paulg@mtghouse.com.

■ HOW IT WORKS

802.1X authentication

The 802.1X standard authenticates wireless LAN end users attempting to access enterprise networks.



Got great ideas

■ *Network World* is looking for great ideas for future Tech Updates. If you've got one and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).

Ask Dr. Internet

By Steve Blass

I'd like to configure the command-line versions of Secure Shell (SSH) and Secure Copy (SCP) that came with the cygwin package (www.cygwin.com) to connect and transfer files to the Linux shell account on our hosted Web site so I don't have to type my password every time I connect. The documentation page says it can be done. I've created my keys with ssh-keygen and copied the public key to the SSH subdirectory in our Web site's Linux system home directory, but it still asks me for my password when I connect.
Why won't it work? And how do I fix it?

It sounds like your service provider is running an implementation of the SSH server daemon that is not configured to support Version 1 of the SSH protocol. Version 1 has been found vulnerable to attack; the recommendation is to use Version 2 instead. The ssh-keygen program lets you specify the type of key to generate. Use the -t flag to specify rsa or dsa (ssh-keygen -t rsa or ssh-keygen -t dsa) to generate Version 2 keys. Then copy the generated public key(s) to the authorized keys file under your Linux account home directory, and you should be set.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark Gibbs



Foaming SOAP

"SOAP Version 1.2 provides the definition of an XML document which can be used for exchanging structured and typed information between peers in a decentralized, distributed environment. It is fundamentally a stateless, one-way message exchange paradigm, but applications can create more complex interaction patterns, [such as], request/response, request/multiple responses, [and others], by combining such one-way exchanges with features provided by an underlying transport protocol and/or application-specific information. . . . Also, SOAP provides a full description of the expected actions taken by a SOAP processor on receiving a SOAP message."

— W3C SOAP Version 1.2 Part 0: Primer, W3C Working Draft 17 December 2001 (www.nwfusion.com, DocFinder: 8637)

So, last week on the way to explaining what Simple Object Access Protocol (SOAP) is, we beat the topic of remote procedure calls into shape because RPCs are essentially what SOAP is all about — invoking a remote process and passing its parameters and optionally receiving a response with optional data.

The key to the communication between the remote process and its client is XML. Under SOAP, an XML-formatted message is used for both endpoints — that is, client and server.

A SOAP method (the process it is being called) is uniquely identified by a namespace universal resource indicator (URI) and an NCName. The NCName maps to the symbolic name of the process being called — otherwise called the method.

SOAP method requests are HTTP post requests that have a SOAPMethodName HTTP header:

```
POST /objectURI HTTP/1.1
Host: www.vitallyimportantinformation.com
SOAPMethodName: urn:vii:buffet#getNumStories
Content-Type: text/xml
Content-Length: nnnn
```

This HTTP header indicates that the getNumStories method under the urn: vii:buffet namespace should be invoked. You can place any valid XML inside the SOAP:Body tag.

The other part of the SOAP request, the HTTP message body, is an XML document. This document contains the information needed to invoke the request.

Let's say that what we're doing is getting news items from a server named www.vitallyimportantinformation.com and what is required is the date of the news. The request would look like this:

```
<?xml version='1.0'?>
<SOAP:Envelope
xmlns:SOAP='urn:schemas-xmlsoap-org:soap.v1'>
<SOAP:Body>
<i:getStories
xmlns:i='urn: vii:buffet#getNumStories'>
<date>032502</date>
</i:getNumStories>
</SOAP:Body>
</SOAP:Envelope>
```

The architecture of the request consists of SOAP:Envelope, under which is SOAP:Body. All that is needed to invoke the getNumStories method is a date, so in this example there is only one child element below the i:getNumStories element.

After the server handles the SOAP request, the response might look something like this:

```
200 OK
Content-Type: text/xml
Content-Length: nnnn
<?xml version='1.0'?>
<SOAP:Envelope
xmlns:SOAP='urn:schemas-xmlsoap-org:soap.v1'>
<SOAP:Body>
<i:getNumStories
xmlns:i='urn: vii:buffet#getNumStories'>
<count>3</count>
</i:getNumStories>
</SOAP:Body>
</SOAP:Envelope>
```

The key to the communication between the remote process and its client is XML.

It really is that simple. Well, OK, it's not actually simple, but unless you're going to become a programmer, that is a sound outline of the SOAP mechanism. If you want more, check out "Inside SOAP" by Don Box (www.nwfusion.com, DocFinder: 8638).

Stay tuned . . . we'll clean up SOAP next week. Scrub-a-dub-dub to gearhead @gibbs.com.



CoolTools

A roundup of the latest neat stuff.

By Keith Shaw

Virtual Ink updates its mimio whiteboard

Virtual Ink recently improved its mimio Xi digital whiteboard product. The company has upgraded flash memory and added a battery-power option that makes the device more mobile, and the unit can now be used with or without a PC in the room.

The stand-alone device is 9 inches when folded, and can record up to 10 hours of meeting notes. It mounts on standard whiteboards and captures every stroke of the marker. Another feature is the ability to be customizable and expandable for future technologies, including wireless devices. The first module, linkUSB, comes standard with mimio Xi and provides fast downloads of whiteboard notes from the mimio Xi bar to a PC via Universal Serial Bus (USB) cable. As other connectivity modules are released (such as Bluetooth, Wi-Fi and infrared), users will be able to interchange them with linkUSB. Mimio Xi will begin shipping at the end of the month for $800. Go to www.virtualink.com for more information.



The Olympus Passport lets users choose which photo to print, especially helpful with passport photos.

Passport/ID system goes digital

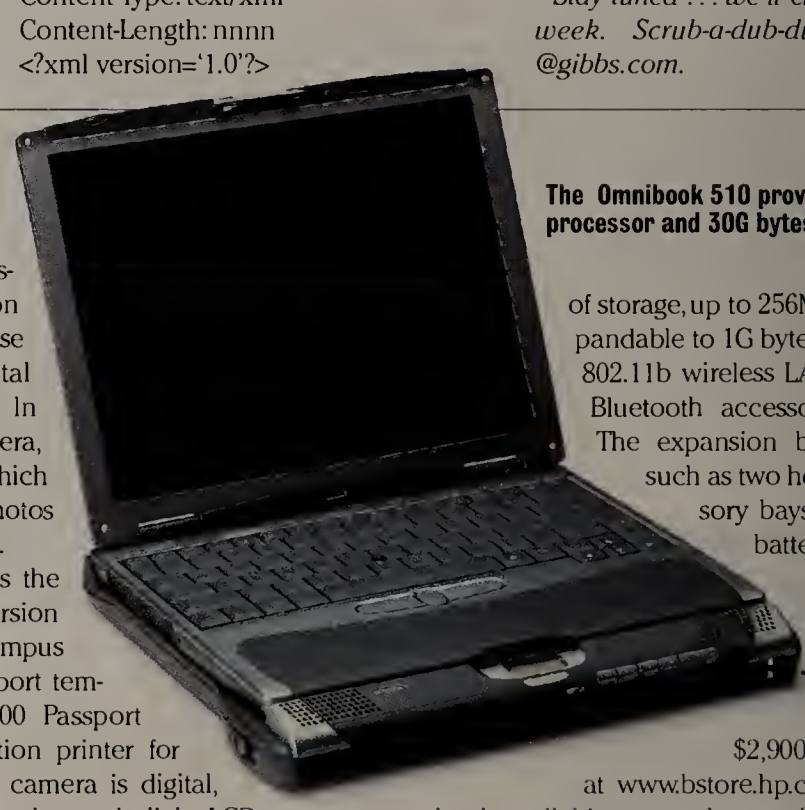
If you've ever had a bad passport photo or identification card, have your boss purchase the Olympus TruePrint Digital Passport/ID Solution ID-200. In conjunction with a digital camera, the system lets you choose which photo will be printed, and photos come out in about 90 seconds.

The ID-200 system combines the Olympus C-3030 Passport Version digital camera, an 8M-byte Olympus SmartMedia card with a passport template, and the Olympus P-200 Passport Version portable dye-sublimation printer for the color prints. Because the camera is digital, multiple shots can be previewed on a built-in LCD screen or TV monitor via video out cable. Two photos can be printed on one shot for passport photos, or four photos per sheet for ID photos.

The system will be available at the end of the month for about $1,500. Go to www.olympusamerica.com/digital.

Hewlett-Packard launches new ultraportable notebook

Marketed toward mobile enterprise and business executives at small to midsize businesses, Hewlett-Packard's 3.65-pound Omnibook 510 includes features such as an up to 1.13-GHz Mobile Pentium III processor, up to 30G bytes of storage, up to 256M bytes of RAM (expandable to 1G byte) and an integrated 802.11b wireless LAN (some models). Bluetooth accessories are available. The expansion base offers options such as two hot-swappable accessory bays to add secondary batteries, another 30G-byte hard drive and a floppy drive. Depending on configuration, it costs from $2,500 to $2,900. It is available now at www.bstore.hp.com. More information is available at www.hp.com/notebooks.



The Omnibook 510 provides a 1.13-GHz processor and 30G bytes of storage.

Opera offers beta for Linux browser 6.0

Opera Software ASA recently released Opera 6.0 for Linux Beta 1, with new speed-boosting functions and exclusive features for Linux users. In addition to greater speed and ease of use, Opera for the first time displays non-Roman alphabets for Linux users, opening up the local markets in the Asia/Pacific and Eastern European region to browser competition.

Opera 6.01 for Linux Beta 1 is available from www.opera.com.

New features include a contact list, cookie management, mouse gestures (perform Linux-specific mouse gestures such as the middle click on window bar to open a clipboard URL in a new window), help window, import bookmarks, bookmark management, quick preferences and e-mail links. Go to www.opera.com for more details.

Send cool tools news to kshaw@nww.com.



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IT TRAINING

RIP-OFF

BY SHARON GAUDIN

Sue Clark, an IT pro at a heavy equipment manufacturer in Wisconsin, was taking online classes last year in the hopes of advancing to a higher-paying job. Clarke was halfway through the coursework she needed to earn her Certified Novell Engineer (CNE) certification when she logged onto the school's Web site one Monday morning last March to find this message:

"The Masters Institute has closed. Sorry for the inconvenience."

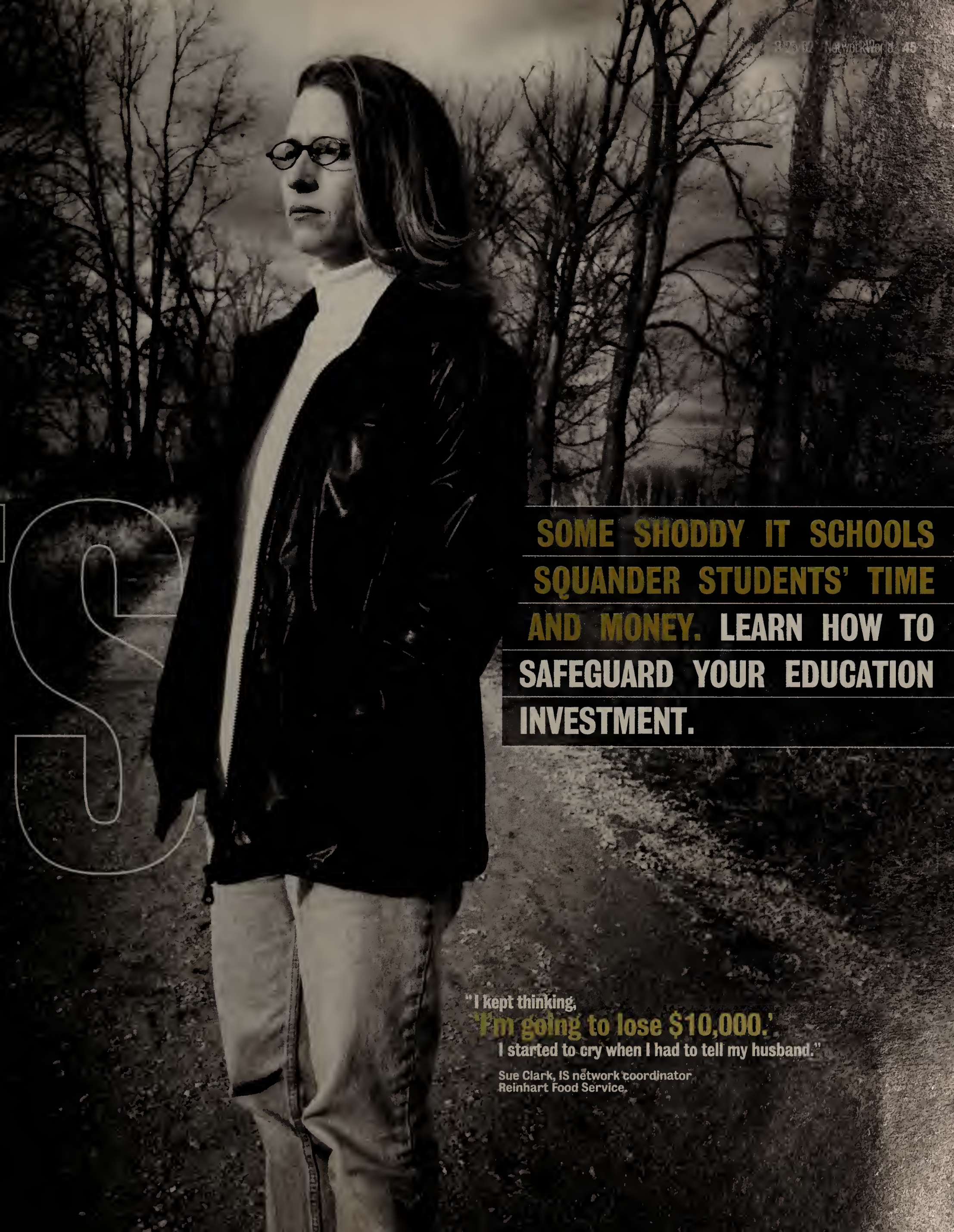
Without any warning, the San Jose computer science training center had shut its doors, leaving Clarke and about 5,400 other students without the certification they were working toward and without their tuition — which came to more than $10,000 a year.

"It was very scary," says Clark. "My family — we don't make a lot of money. That's why I was going to school so I could get a better job and improve our standard of living... I kept thinking, 'I'm going to lose $10,000. I started to cry when I had to tell my husband."

Fortunately for Clark, it all worked out. She was able to transfer her student loan and continue her IT training at the University of Phoenix. And she recently landed a higher paying job as IS network coordinator at Reinhart FoodService in LaCrosse, Wisc. "My training definitely helped me get this job," she says.

IT training is big business. Last year, U.S. companies spent roughly $12 billion to train their techies, according to IDC. Network executives want to keep their IT staffs — everyone from those manning the help desk to system administrators — on the cutting edge of technology that continues to change at lightning speed. What's more, thousands in the IT field are footing the bill themselves for education that will help them climb the corporate ladder.

Regardless of who writes the check, they're paying upward of $15,000 or even $20,000 a year to do it. In a flagging economy, that's a steep investment for a company, especially when you multiply it by several employees. And for someone reaching into her own pocket, the hefty price tag could wipe out a nest egg or rack up student loan payments for years to come.



SOME SHODDY IT SCHOOLS SQUANDER STUDENTS' TIME AND MONEY. LEARN HOW TO SAFEGUARD YOUR EDUCATION INVESTMENT.

"I kept thinking,
'I'm going to lose $10,000.'
I started to cry when I had to tell my husband."

Sue Clark, IS network coordinator
Reinhart Food Service.

But how safe is that training investment? And how much work are companies actually doing to make sure their training funds, and their IT staffs, are well cared for? Getting good training isn't so simple, students and IT executives say.

Clark isn't alone in her training disaster. In California, 300 of the state's 3,000 private post-secondary and vocational institutions close every year, according to the California Department of Consumer Affairs. A spokeswoman for the U.S. Department of Education says the organization doesn't track the number of schools and training centers that shut down, but it could number in the thousands.

Underperforming investments

The number of failing schools means many people are losing a lot of money.

Students such as Clark who took out student loans to pay for training were able to transfer those loans to other schools or training centers. They lost time, momentum and often enthusiasm, but didn't lose all their investment.

However, students who paid for classes out-of-pocket and corporations footing the bill for their employees simply lost that tuition. It wasn't retrievable or transferable.

"I actually had only another month and a half before finishing when the Computer Learning Center [CLC] closed," says Kenton Payne, a network administrator in Fort Washington, Pa.

He paid $3,000 and took out $12,000 in student loans for an eight-month network engineering boot camp. "There were a number of students who had literally just started, and some of them had paid all cash upfront. They paid $15,000 and got four weeks of education," he says.

CLC, in Alexandria, Va., has a story similar to Masters'. Both training centers closed down early last year without prior notice to students or government agencies. CLC had 2,500 students enrolled when it shut its doors. A spokesman for the California Department of Consumer Affairs says both institutions were underfunded and overextended, bringing in too few students for new e-learning ventures and underestimating the cost of the new online programs.

Compounding their problems, both Masters and CLC were investigated by the Department of Education, which reported administrative problems at the schools.

But financial distress and school closings are only part of the problem. Students, industry analysts, high-tech job recruiters and even one instructor say some training centers offer poor-quality instruction — at full price.

"The teachers really didn't have a hold on the subject matter," says Payne, who crammed for two months after CLC closed down to finish studying for the Microsoft Certified Systems Engineer (MCSE) certification exam. "Sometimes students began teaching more than the teachers. . . . Classes organized little coups. Students complained about some of the curriculum and the teachers in charge."

For Jake Mavity, a 20-year-old tech support worker at a California software company that he asked not be identified, the quality of the instructors was just the beginning of his training problems. Mavity paid $9,000 to the Santa Ana, Calif., branch of Lanop Center to study for MCSE, CNE and Certified Cisco Network Associate certification, only to get to class to discover that the instructor was handing out photocopies of the instruction manual, complete with Xs where photos or network design illustrations should have been. And to add insult to injury, it was a photocopy of an outdated manual.

And that's all before Lanop, a 15-year-old company that trained people to take high-tech certification tests, closed down last spring — before Mavity could get all of the certifications he wanted.

Mavity wasn't the only one with training trouble. There were 12 U.S. centers operating under the corporate Lanop umbrella, according to John Goodfriend, Lanop founder and president, who says he's not sure how many students were enrolled when the schools closed last year. Goodfriend says he tried to sell off each center as individual franchises but says he believes only about five now are operating independently.

"By the time we closed, we were in terrible shape," says Goodfriend, who blames Lanop's demise on Microsoft forcing platform upgrades and discontinuing certifications. "That was sort of a disaster."

After Lanop went under, Goodfriend tried to start up a group of Linux-based training centers, called Linux Centers USA. Without the support of a major vendor, Goodfriend says the venture never took off. "It was a good idea that didn't work."

For Mavity and other students like him the core problem lay with the training itself.

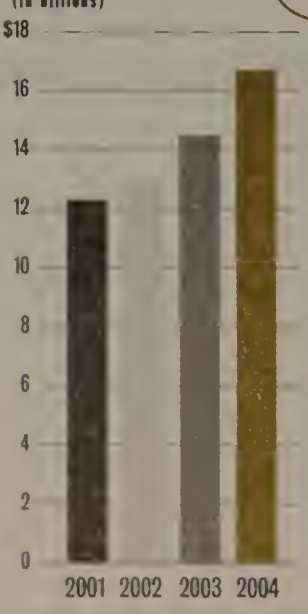
"I barely passed my test," says Mavity, who knew enough of the old material to scrape by. He says of the Lanop facility, "There was network cabling hanging down from the walls. The network had been kind of thrown together. . . . It was really stressful, and I was frustrated and angry. It's still kind of hard to talk about."

That's a common complaint, according to Dennis Hartle, a senior Novell instructor who taught at Lanop for 2 1/2 years. Hartle says some training centers graduate students who haven't laid hands on a network,

See Scam, page 48

Big bucks

Already a billion-dollar business, IT training is on the rise. Here's a snapshot of the market:



- For all IT training last year, $1 billion (8% to 9%) went to network-specific training. The largest chunk ($1.6 billion, or 12%) went to enterprise resource management applications.
- In 2001, $2.9 billion of the corporate-funded IT training market went to online training. That number is up from $1.7 billion in 2000.
- IDC estimates the number of students getting their IT training online should increase 35% to 40% by 2005.
- According to the International Association for IT Trainers, an average day of training costs $225.

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- Subscribe to our free IT Education and Training newsletter.

DocFinder: 8625
www.nwfusion.com

Weeding out the weak schools

***Finding** not just a good school, but the right school for you or your employees, will undoubtedly fall on your own shoulders. Do some investigative work before you sink any money into a training center or a university. Here's a list of suggestions from IT students, training professionals and high-tech recruiters:*

CHECK OUT THE SCHOOL or training center's background.

- What's the job placement rate — if everyone who went there is a taxi driver, look somewhere else.
- What's the school's financial and certification standing?
- How current are the materials being used? Last year's textbook could very well be outdated by now.

ASK TO BE CONNECTED with former students so you can talk to them and get their take on the school and the courses they took.

- Talk to former students' employers to see how much they benefited from their training.

CHECK OUT the instructor.

- Has he actually studied this area?
- Has he actually worked in the field? Make sure students are studying with someone who has had day-to-day experience and not just book knowledge.

MEET the instructor.

- Does he speak fluent English?
- Does he communicate well and have good interpersonal skills? Just knowing the subject isn't enough — the instructor needs to be able to communicate it to his students.

TALK TO OTHER COMPANIES and see where they've had the best luck with employee training.

CHECK OUT ARTICLES in the press about the school or training center — are they getting attention for problems or accomplishments?

FIND OUT if the school incorporates hands-on time in the classroom.

MAKE A LIST of which training centers and schools employees can use.

SET UP POLICIES for choosing training centers or educational institutions employees can use.

FOR STUDENTS studying networks, make sure there actually is network gear there to work on.

FOR STUDENTS looking into IT training on their own, follow many of the corporate guidelines and make sure you also:

- Find out if the center or school has business partnerships so students have opportunities to get internships and gain practical experience.
- Find out if the school has a strong and active alumni organization that can help you network and find a job.
- Talk to companies where you'd like to work and see what they're looking for.
- Find out if students will receive assistance with job hunting.

IF AN IT SCHOOL you're attending closes:

- Call the U.S. Department of Education.
- Call your local District Attorney.

— Sharon Gaudin

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Over the past decade, the Total Cost of Ownership (commonly referred to as TCO) for server infrastructures has been moving in one direction: up. And without the right solutions, this trend shows no sign of reversing itself. Now comes the good news. When compared to server consolidation solutions from Sun and Compaq, IBM can reduce your TCO by nearly 40% over five years.* How? By enabling servers to utilize a higher level of capacity, manage workloads more effectively, and provide the reliability needed to keep them up and running. One thing that helps to make all of this possible is a powerful, ongoing IBM @server initiative – which enables us to continually develop new, innovative, self-managing features that can make I.T. infrastructures more advanced yet less complex.

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Scan:
Continued from page 46

teaching them less about the network and more about what to memorize.

"[After they graduate,] the students are not prepared for a job," says Hartle, who now teaches at Computer Education Institute. "It's the way the subject matter is taught — or not taught may be a better way to put it.... Memorize the answers for the certification test. Take the test. They're not teaching for them to have a job."

The way to avoid these problems is to thoroughly investigate any training center before signing up. IT managers should set policies about which training centers or schools employees can use, according to analysts, students and corporate trainers.

"There are some bad apples that are spoiling the whole lot here," says Bob Klehm, research director at Giga Information Group. "There's a lot of information out there ... and they need to kick as many tires as they can."

Creating a list of what training centers can be used, along with a policy on how classes are paid for, saved Lanetta Denise Pitney's employer about $10,000.

Pitney, an IT specialist at a large California testing and measurement company, started taking MCSE for Windows 2000 classes last January at a small branch of New Horizons Computer Learning Centers, which is headquartered in Anaheim, Calif. She says the classes were hands-on and practical, and all was moving along fine until that particular branch shut down toward the end 2001.

Pitney's employer, which didn't want its name used, didn't lose its $10,000 because company executives struck a deal with New Horizons that the payment would go straight to New Horizon's corporate headquarters and not to the branch's coffers. Pitney is continuing with her certification training by taking New Horizon classes online.

Barry Stauffer, CEO of Corbett Technologies in Alexandria, Va., an $11 million IT security firm, says having a tuition reimbursement program is one of the ways he takes care of his staff. Corbett offers each full-time employee $5,000 a year for job-related training, and last year he spent $20,000 helping to train 20% of his workers.

But finding a good school and working out the deal is up to the employee.

"We've not prescribed [where they can go], though we certainly recommend some," Stauffer says. "I'm not too concerned because most of our people are going to regular colleges and universities in the area.... Though, it's something we need to consider."

However, some companies get more involved.

At BankOne in Chicago, there's actually a full-time, eight-person team that sets up training for the company's 2,000-member IT staff. The financial giant largely offers its IT employees in-house training — called BankOne University — but offers tuition reimbursement for classes taken with outside vendors.

But BankOne is very specific about which training firms employees can use.

"We do a lot of investigation into any vendor," says Debbie Graye, training manager for technology and operations at BankOne. "We do a rigorous analysis of the state of the vendor's business."

Graye says BankOne also compares pricing; finds out if the training center will customize a student's course makeup; checks the background of the vendor and the instructors; and even sends people to audit the classes.

And for a company that has previously spent $750,000 on IT training a year, that's simply guarding its investment.

Last year's school closings might actually have been good for the IT training industry, says Marjorie Bynum, vice president of workforce development at the Information Technology Association of America.

"It's been a warning to students," Bynum says. "People are investing in their education and career ... and people need to do as much homework as they can before committing. And it's a reminder to schools to mind their p's and q's." ■





David Swan, senior manager of global network operations, Altera.

Planning to spend less

Capacity-planning software takes on a new role in slow economic times.

BY DENISE DUBIE

Capacity-planning software was created to help network executives plan for long-term growth and implement new initiatives. But in today's tough economy, those same planning tools are being used to help companies make their existing assets stretch further.

"Typically, the thought with capacity planning is 'I want to buy more,' but to me, that's a flawed understanding. It doesn't have to be about buying more," says David Swan, senior manager of global network operations for Altera, a maker of programmable logic devices.

From Altera's San Jose headquarters, Swan plans the company's network needs in the U.S., Europe and Asia. Although he could not reveal specifics, the cost to maintain connectivity on Altera's frame relay, ATM, leased lines and VPN circuits can exceed $100,000 per month. So when network performance starts to degrade, Swan says his first thought isn't to invest in more resources.

"The first things that come to mind for me are, 'Do I need to better prioritize what I've got?' or 'Do I need to more efficiently use my network based on the pattern of usage?'" Swan says. The capacity-planning process he uses shows which applications and users hog bandwidth and when. He can also determine the types of usage that demand a VPN circuit, which is typically a lower-cost circuit. This helps him plan around network-consuming activities and meet each department's bandwidth needs — without investing in more circuits.

"[Capacity planning] lets us manage the mix of circuit and resource types. It has allowed us to delay an increase in circuits for at least six months, and in the meantime, we've been able to deliver more sophisticated quality of service," he says.

Frank Walters, senior network engineer at the Illinois Century Network, shares Swan's philosophy. Fortunately for Walters, his budget isn't shrinking, and he can continue to purchase more bandwidth when necessary. The one hurdle he encounters in terms of capacity planning is getting the bandwidth from local providers and the OK from city officials in time to best serve his users. He says because of the delay in getting more lines wired to his network, he has to ensure his network will continue to run smoothly for more than six months at a time.

Walters must project the needs of the Illinois Century Network, a service provider that maintains point-to-point and peer-to-peer Internet access for Illinois schools. He says it sometimes can take from six months up to one year just to get the right of way for a new OC-12 line from city officials, and in the meantime, Walters must reallocate resources so users don't notice any degradation in service.

"Even if we're not able to get the lines upgraded, [capacity planning] helps us to identify the pipes that aren't fully utilized," Walters says. "It just makes sense to better use what we already have, and it pushes our deadline out a little bit so our users don't have to suffer."

Swan and Walters use capacity-planning software tools from NetScout and Clairvoyant, respectively. NetScout Capacity Planner helps network engineers spot usage trends in historical performance data and predict where more bandwidth may be needed. Clairvoyant's ForeCast Manager works with real-time information and can spot more immediate problems for network engineers looking for a short-term resolution.

These are just two of the many products designed to help network planners see where performance is lacking and how to boost the network. Some software uses model networks to simulate traffic. Others pose what-if scenarios to better calculate how the network may behave under heavy load and high traffic conditions. Companies such as Opnet, Compuware, BMC Software, Aprisma and Computer Associates — among many others — offer some type of capacity-planning software.

"Users now are looking for the short-term [return on investment (ROI)] when they spend any money," says Jean-Pierre Garbani, an analyst at Giga Information Group. "Capacity planning has gone from long-term optimization to providing immediate results, and users want that kind of instant gratification."

That's especially important this year because with budgets tight and estimated spending on hardware flat or falling, network planners need to find ways to stretch their existing network infrastructure and avoid spending IT dollars. Giga recently estimated that spending on computer and telecommunications equipment in 2002 will be down $5 billion, a 5% drop from 2001, while spending on software is expected to grow a modest 8% this year.

George Duguay, senior network engineer at American Tower, says he saved money by investing in new capacity-planning software. Using NetScout's tool set, Duguay estimates he saved the Boston Internet and wireless tower builder more than $1 million per year in circuit costs. American Tower has 60 sites across the country, each connected over a frame relay WAN. Duguay uses NetScout's nGenius Capacity Planner along with the company's Real-Time Monitor software to monitor WAN circuit utilization.

"We were able to plan appropriately and customize each site based on usage," Duguay says. American Tower used NetScout to plan for about three months out, and Duguay says he saw money-saving results within six months. It took some configuration, but otherwise he says the quick turnaround time mostly can be attributed to NetScout's ease of use.

This new fervor for faster results has gotten smaller companies such as Niksun, Adlex and NetQoS more attention. The vendors all sell performance management appliances that passively watch network traffic and pinpoint what applications or users cause slowdowns. And Garbani says, "Users see these devices as a great source of short-term ROI. You pay $50,000 once and it tells you where you have a problem."

The appliances also can show quickly how to fix the performance problems, but Garbani warns that the benefits provided by these boxes is limited to the size of the network and the time users are willing to invest.

"In the real world, there really is no such thing as instant gratification," Garbani says.

"If you look at the economics, correcting a problem after the fact always costs more money. And if you choose to provision — or not to — in a hurry, you won't get the best deal," Garbani adds. ■

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- **Kent Beck** | Director, Three Rivers Institute
- **Marc Benioff** | Chairman & Founder, salesforce.com
- **Rajeev Bharadhwaj** | CTO, Ejasent
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** Attendance to these events is available on a first-come first-served basis. Space is limited.*

KEYNOTE SPEAKERS



Dr. John Seely Brown
Chief Scientist
Xerox Corporation



K. Eric Drexler
Chairman
The Foresight Institute



Patrick Gelsinger
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Vinod Khosla
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NetworkWorld Review

Cisco's Catalyst 3550 midrange switch

Layer 3 switch delivers flawless wirespeed performance.

■ BY JOHN BASS, NETWORK WORLD GLOBAL TEST ALLIANCE

Cisco has designed its new midrange Catalyst 3550-24 switch to connect access devices to the core of large and midsize enterprise networks, and from what we found with our performance testing, it is well equipped for the task.

The Catalyst 3550-24, which ships with 24-port Fast Ethernet and two-port Gigabit Ethernet capacity, earned its strong overall score because of its near-perfect performance in our tests. The box produced wirespeed throughput even while handling access control lists (ACL) we intentionally applied to try to slow it down. The only fault was with the Web-based management interface called Cluster Management Suite (CMS). The interface is usable but a little buggy, as noted when we tested it on other Cisco midrange switches (www.nwfusion.com, DocFinder: 8526).

Basic Layer 3 performance is picture-perfect with wirespeed throughput throughout our suite of tests and only a 120-microsec latency measurement with 64-byte packets. (See "How we did it" and performance charts at www.nwfusion.com, DocFinder: 8621.)

In addition to our basic throughput tests, we set up several ACL entries to see how the switch reacted to heavy network traffic loads. Usually an ACL will bog down the processor of a router or switch of this type, which reduces the sustainable throughput and increases packet latency. The Catalyst 3550-24 showed no signs of performance degradation with an ACL enabled. This is rare for this class of Ethernet switch.

Our three routing tests showed that the Catalyst 3550-24 can maintain 64,000 external routes for Open Shortest Path First (OSPF) and 4,500 routes for Routing Information Protocol (RIP) in its route table. It's one thing to be able to support dynamic routing protocols, but it's another thing to handle dynamic routing when certain links or devices are intermittent. While sending traffic at 90% wirespeed, we advertised 80% of the route table capacity to the switch, withdrew 50% of the resulting routing table and then readvertised the withdrawn routes. The Catalyst 3550-24 showed good stability while simulating a hostile routing scenario by quickly reacting to all the routing changes.

The Catalyst 3550-24 implements rate-limiting ACLs perfectly, which is a good ability to have if you need to set a traffic ceiling on certain problem flows such as Web surfing traffic.

In terms of quality-of-service (QoS) features, the four egress queues on each port work as advertised. Our testing showed that the 3550 can drop packets appropriately under congestion and send higher-priority packets through more quickly while the ports are not congested.

In addition to its OSPF and RIP features, the Catalyst 3550-24 ships with other typical Layer 2 and Layer 3 capabilities, including support for virtual LANs, fast Spanning Tree Protocol, Interior Gateway Routing Protocol and Enhanced Interior Gateway Routing Protocol.

Software upgrade delivers core switch features

The Catalyst 3550-24 comes with a Standard Multilayer Software Image (SMI), but our test unit was upgraded to include the Enhanced Multilayer Software Image (EMI). The EMI provides more enterprise-class features such as hardware-based IP unicast and multicast routing, intervirtual LAN routing, and support for Hot Standby Router Protocol. The switch can be upgraded from SMI to EMI after deployment.

The Catalyst 3550-24 has features usually reserved for core-class enterprise switches, including ACLs, rate limiting, weighted round robin queuing and Differentiated Services code point. Our testing showed that these features work as advertised.

The switch is scalable if it's used for what it's designed to do. Cisco claims it can support up to 16,000 routes. We confirmed 64,000 routes with OSPF but only 4,500 routes using RIP. Even though it doesn't live up to marketing claims, 4,500 routes should be plenty to handle most enterprise networks.

To help ease the difficulties with configuring the feature-rich Catalyst 3550-24, Cisco included its CMS with this bundle. CMS is a Java-based, Web-accessible management interface with built-in configuration wizards to ease the setup of the Catalyst 3550-24 and to help customers implement applications such as voice over IP and network security.

CMS is a great idea because it offers an easy feature-configuration interface — especially for setting up QoS parameters — but the overall implementation is far from perfect. We noticed several bugs in the interface. CMS shows the wrong value in the rate-limit configuration — it showed 50K bit/sec instead of 50M bit/sec, and we had to reboot the switch for the rate limit we configured to become effective.

The Catalyst 3550-24 can be configured and monitored through the Cisco command-line interface and SNMP.

Installation and initial setup is a breeze. CMS certainly helps with setting up the switch out of the box, even with its bugs. Alternatively, the IOS setup command helps users through the configuration process. The documentation with the switch helps users rack the switch and power it up. Beyond that, they must use Cisco's extensive Web documentation to learn how to configure the switch software.

The Catalyst 3550-24 has a lot of great features with good performance to back it up. This would be a great switch for midsize to large enterprise networks needing a multilayer switch with the capacity to handle large amounts of bandwidth and features to manage applications flowing over the network.

Bass, a senior technical staff member at CNL and co-author of McGraw Hill's Building Cisco Multilayer Switched Networks, *designs and leads the execution of the test suites. He can be reached at john_bass@ncsu.edu. Sangram Kadam and Khurram Khan assisted with the testing.*

Net Results

Catalyst 3550-24

4.4 RATING

Company: Cisco, www.cisco.com **Cost:** $5,500 as tested. **Pros:** Great Layer 3 switching performance, strong set of features normally found on core routers. **Cons:** CMS management interface has a few bugs.

What's the score?	Catalyst 3550-24
Performance 30%	5
Features 25%	5
Management 25%	3
Scalability 10%	4
Installation/documentation 10%	5
TOTAL SCORE	4.4

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

Global Test Alliance

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Management

Strategies

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- BUSINESS JUSTIFICATION

Bleeping beepers

Self-driven IT executives see duty and dedication in being on call 24-7.

■ BY SUZANNE GASPAR

After working more than 30 years in IT, Gregg Saffer knows the rigors of the pager. He once had to cancel a Disney vacation after he got called in for the December holiday break to implement changes to the payroll system. A software vendor incorrectly programmed the changes, and Saffer needed to reinstall and retest the system to comply with new tax rates going into effect Jan. 1.

Saffer, CIO for Avis Rent A Car System in Garden City, N.Y., says canceled vacations are common for IT professionals when project pressures often clash with family time. While his children were initially disappointed, open communication was important. His wife understood that his position and tenure with the company meant he was relied on to get the job done.

"There's an element of trust that you'll follow through with your promises," Saffer says, noting that he eventually rescheduled the trip.

Being on call around the clock and on weekends, testing systems at 2 a.m., even working a 35-day stretch — Saffer knows the downsides of the job. It comes with the turf, just as adrenaline surges when he responds to a call. "Sometimes you come in the next morning and feel like you saved the day," he says.

From malls to playing fields, in restaurants and nightclubs, IT executives are hot-wired to their networks, toting pagers, cell phones and laptops to remotely troubleshoot most support calls.

"It's a chance to play a critical role in IT, gain a sense of pride and accomplishment," says Gerald Shields, vice president for AFLAC, an insurance firm in Columbus, Ga.

Shields was paged one Sunday evening last month when a scheduled outage was running behind. The onsite manager handling the upgrade of channel adapters in a storage device followed call escalation procedures when it became apparent that the job was running three hours behind and wouldn't be finished by Monday morning.

"I recommended they execute the back-out, but they wanted to talk about it," says Shields, who drove the 40 minutes into the office to confer. In the end, the team decided to reschedule the upgrade.

Shields' work also has encroached on his vacation. In 1997, during a family reunion in the mountains of North Carolina, Shields was eight hours from home. His office tracked him down at the number he gave them because a new enterprise resource planning system was losing data and having trouble with order-processing.

Equipped with a poor campground phone connection, he had to keep switching the line between his laptop and the phone to remotely monitor systems and talk to the staff. "I spent the whole day working on the problem," he says.

Debi Mayes, IT manager at Southwest Airlines in Dallas, recalls getting paged at her sister's 40th birthday bash, for which she was the designated driver. With music blaring in the background of the girls'-night-out club, Mayes called from a pay phone to learn that a financial reporting job was down. She passed along instructions for staff to try and said she'd check back later. Sure enough, she got paged again at 10 p.m. and had to go in to fix the problem. "Word spread fast that I arrived in late on the call. The next morning I had people walking in my office waving dollar bills," Mayes says.



MICHELLE BARBERA

Pool party poopers

Pages happen anytime, anywhere, IT executives say. It's an awkward intrusion to be paged at the soccer or football field, at pool parties or with your wife, says Kim Yaworsky, IT director for Bay State Milling in Quincy, Mass. "I've spent an entire afternoon on my laptop at a pool party," he says.

Some problems put staff in tight situations. A flawed chipset forced Jon Bascom, vice president of IT for AutoZone in Memphis, Tenn., to fly back to a remote office the same day after having just returned from upgrading the equipment.

"It was early evening. I had barely unpacked my bags. I caught the last flight out and put the old chipset back in, just in time," Bascom says.

Monitoring each individual's on-call time is critical so that too many hours aren't spent on the job. But even when you're not on call, you can get called, staffers say.

"We work as a team. Everyone is here to help each other out," says Chad Johnston, a telecommunications analyst for Mutual of Omaha. Johnston says it helps when his manager offers him two days off for putting in a long stretch over three days on a mock disaster-recovery call.

But IT executives say they never truly get away. "It's hard to detach when you feel obligated to check e-mail three times a day while visiting with family," says Jayson Kim, director of Web applications for J.Crew in New York. "Who's not going to call and check on issues when you have a $100 million dollar Web site?"

Recently, Saffer spoke with a weary-looking colleague who was trying to decide whether to take his pager on a four-day family vacation. "I suggested he consider not bringing it," he says. ■

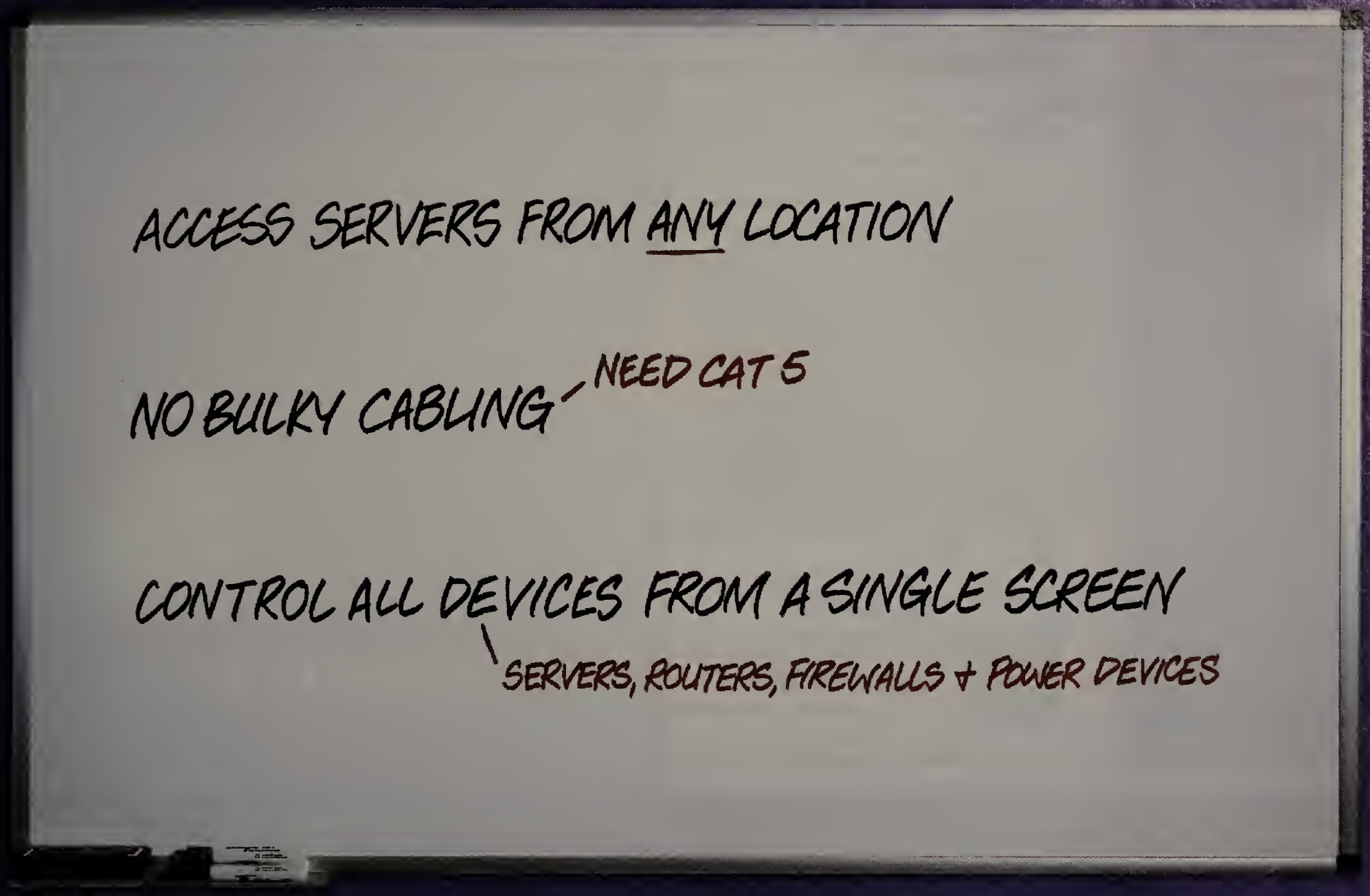


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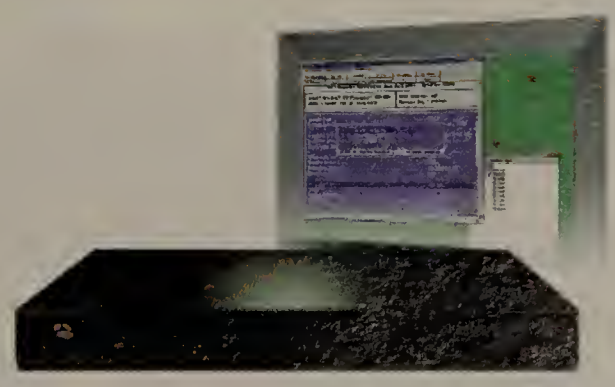


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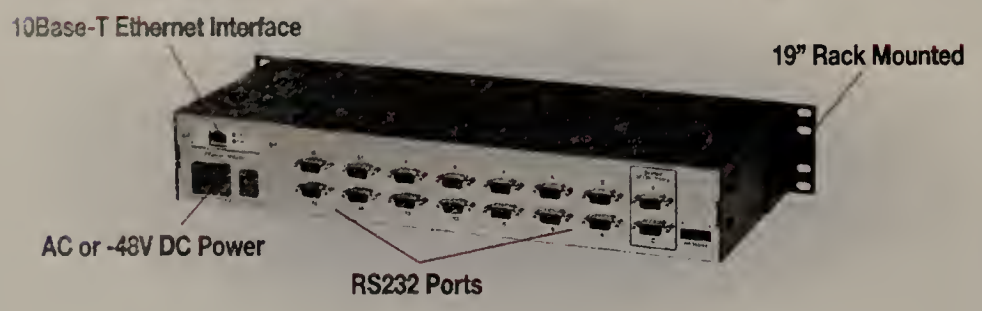
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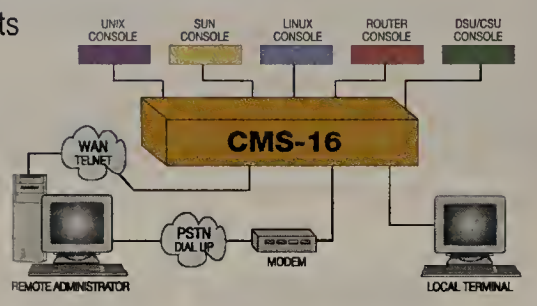
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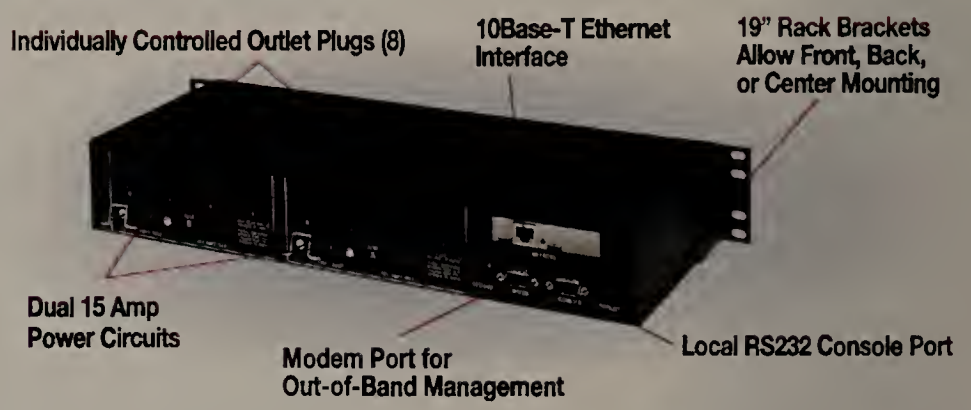
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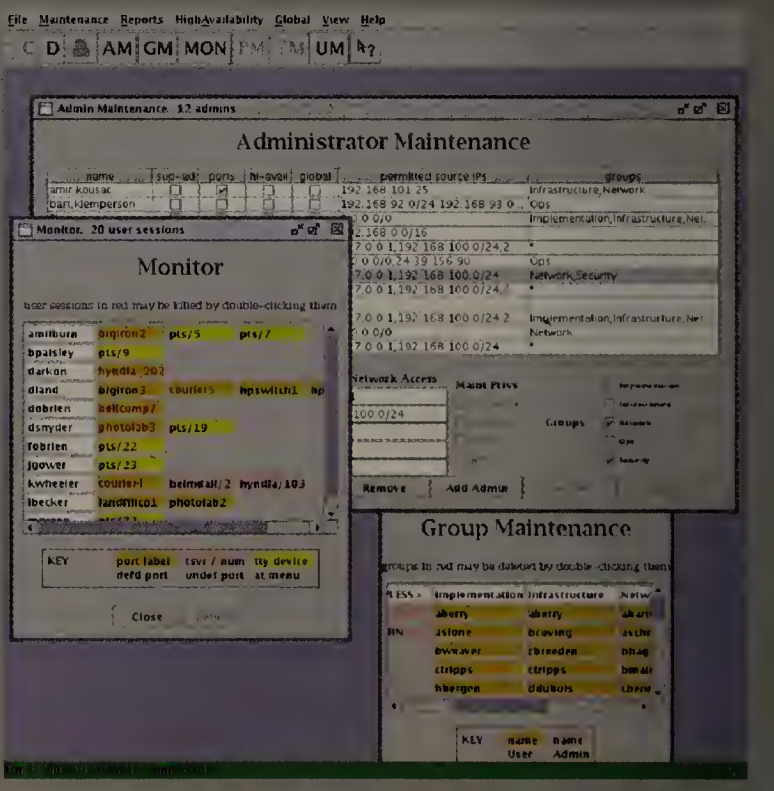
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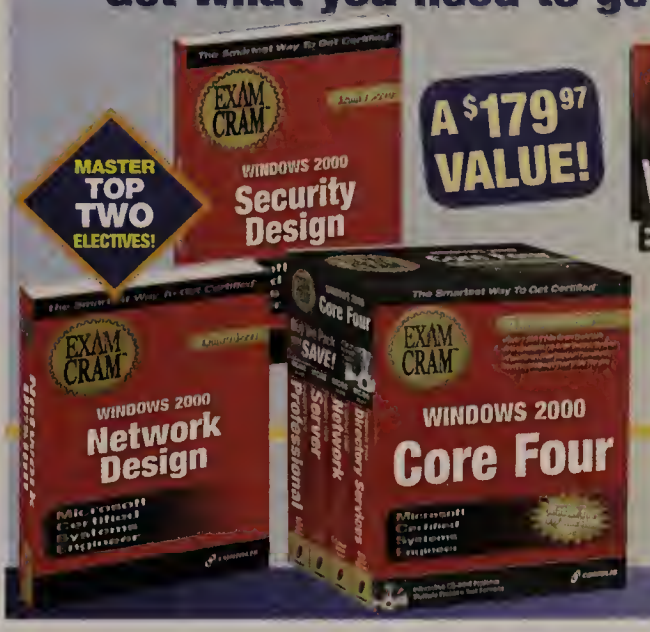
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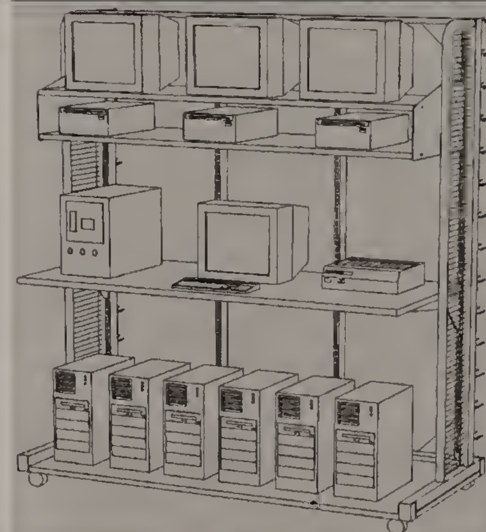
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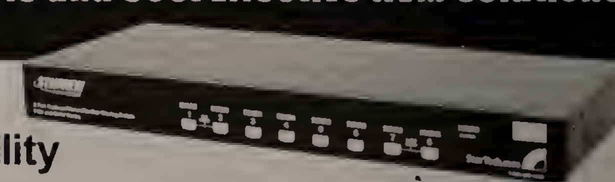
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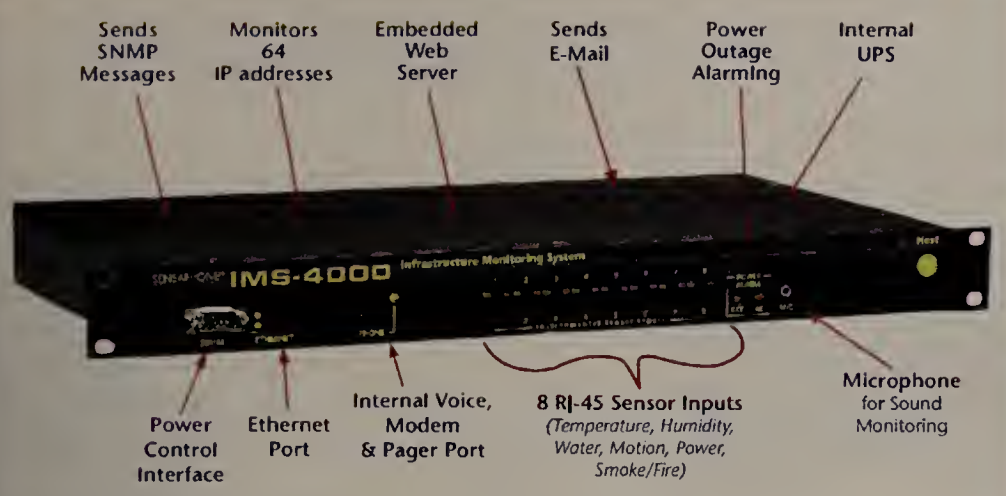
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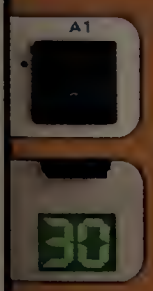
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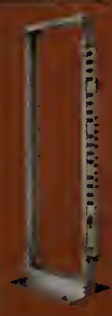
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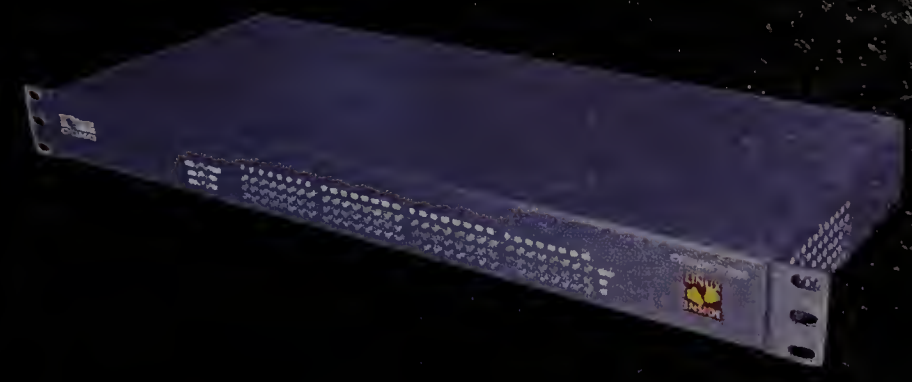
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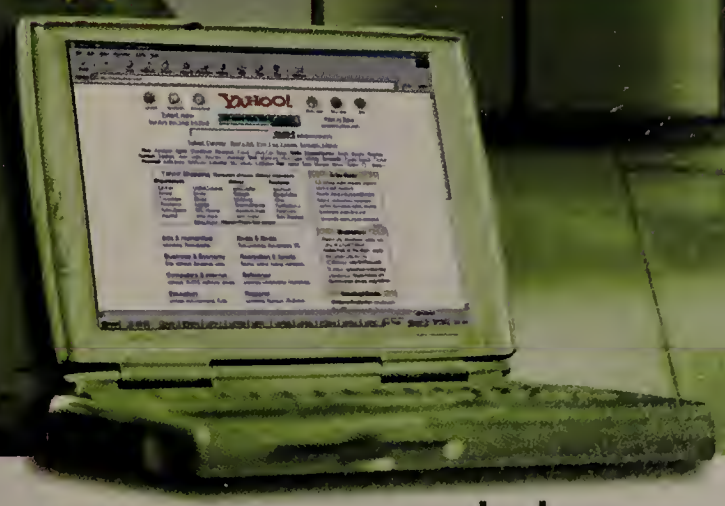
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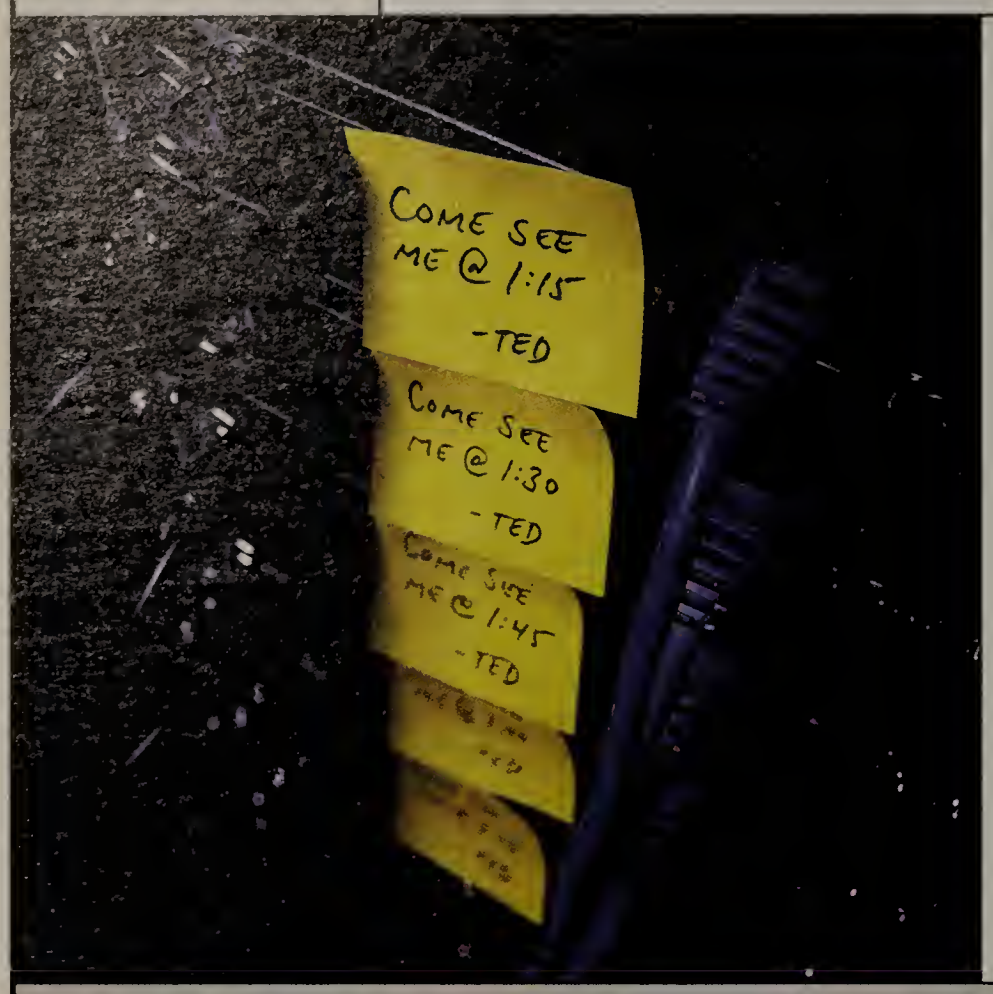
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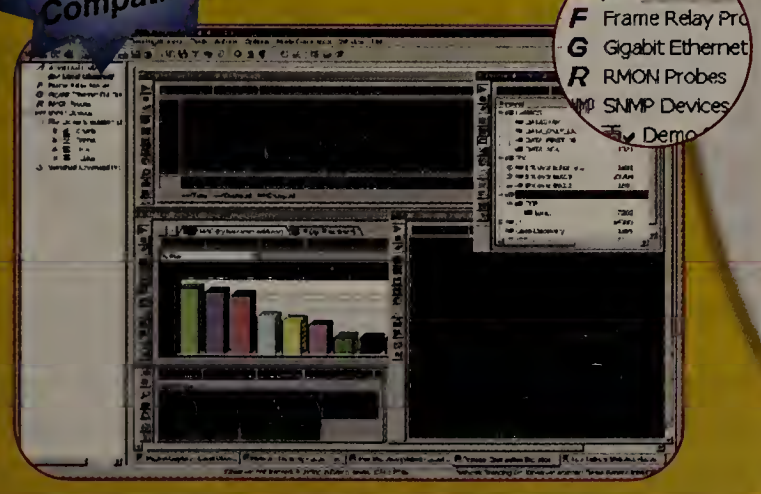
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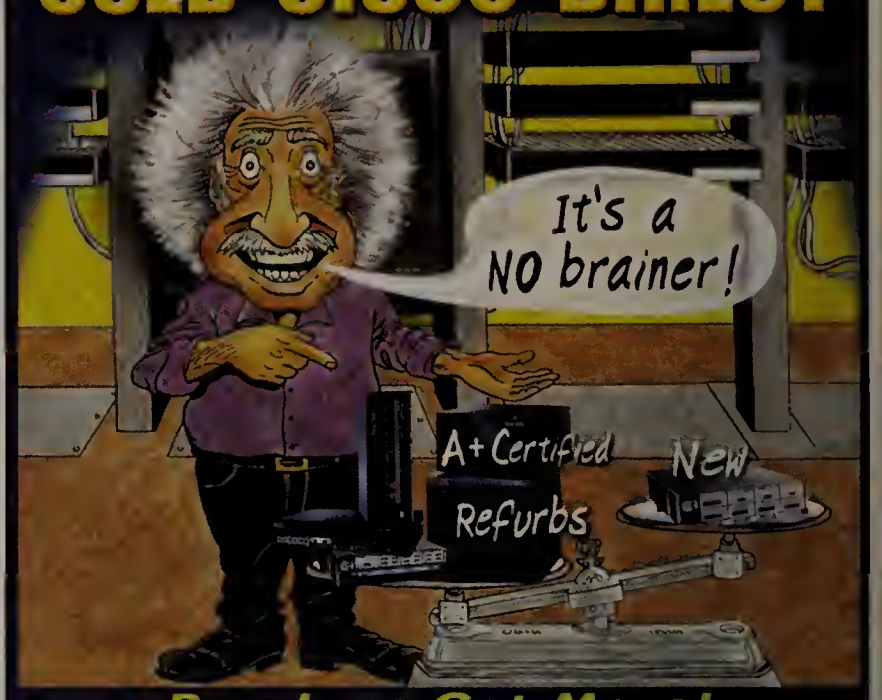
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EpicEdge is seeking Java Developers/Sr. Java Developers. Requirements include BS/MS or equivalent. Java, Commercial Application Server and Integration experience required. Client/Server experience needed.

For consideration email or mail your resume by April 8th to jobs2@epicedge.com or to EpicEdge, Human Resources, 5508 Highway 290 West, #300, Austin, TX 78735. Positions are located in Seattle, Washington. No relocation assistance provided. Absolutely no agency inquiries accepted. Only qualified candidates will be contacted.

Exp'ed Prog/Sys Analysts, Network Engineers, DBAs and S/W Engineers required for branch locations in Santa Clara, CA, Mt. Laurel NJ, Conshohocken, PA. Skill sets - C, C++, Java, HTML on UNIX/Windows; Visual Basic, Visual C++, Power Builder; Oracle, PL/SOL, Pro*C; UNIX, Windows 2000/NT Sys. Admin. Require BS/MS in CS/Engg/Math/Business/Science (or its foreign equiv and/or equiv. in education and exp.) And relevant exp. Travel/ Relocation required. Salary commensurate with exp. Resumes to: HR, Fourth Technologies, 27 Roland Avenue, STE B, Mount Lourel, NJ 08054. Indicate on resume the branch office you are applying for.

BUSINESS ANALYST/ PROGRAMMER to combine financial modeling/software development using Delphi 5.0, 6.0,client server environment, SOL server 2000, interface, conduits writing. Architects software solutions for specific business needs. Require: must have a minimum Masters in Computer Science/related subjects & 2 years of experience; will accept Bachelor's degree with 5 years of experience. Salary: $45-55K.Fax resumes to 478-742-6449

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Software Engineer in CA: Develop mass computer storage management software using C, Oracle, Sun Solaris & PL/SOL; deploy application software to Windows NT & HP Unix; consult vendors. Extensive travel. Req MS in engineering, computer science or related plus 2 yrs work exp. Send resume to DeLaLuz Technologies, Inc., 4340 Scotts Valley Dr., Ste. D, Scotts Valley, CA 95066.

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Network Administrator. Design and troubleshoot enterprise computer network using Cisco networking products and other products such as HP-UX system, using HP 9000 server and workstations; maintain IBM AS/400 network and Windows NT/2000 network administration in an enterprise environment; implement MS BackOffice products, including Exchange, SOL, IIS, Proxy, and SMS; provide technical assistance; and implement backup procedure for information system, using ARC server 2000. Must have Bachelor's degree in Computer Science or related field, plus two years experience, and knowledge of Cisco equipment; HP-UX system using HP 9000 network administration; IBM AS/400 and Windows NT/2000 system operation; MS BackOffice products including Exchange, SOL, IIS, Proxy, and SMS; and AS/400 operation and communication. Send resume with cover letter to Sears Manufacturing Company, Attn: Gery Oestern, 1718 South Concord St., Davenport, Iowa 52802.

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Sr. IT Consultant (Sr. Software Engineer) sought by land management services/solutions company in Denver, CO to work in Houston, TX and other unanticipated job sites in the US. At a senior level, design, develop, enhance and support integrated object-oriented software applications that run in a Windows environment and/or are Web-based for land management in the oil and gas industry to manage multiple leases, contracts and division orders. Software applications incorporate Graphical User Interfaces (GUIs), client/server architecture and Oracle Relational Database Management Systems. Use PL/SOL, JAVA, Visual Basic, Power Builder, HTML, ASP, the Install Shield tool, and other development tools and languages. Engage in project management as required. Requires Bachelor's or foreign equivalent in computer science, electronics engineering or related field; 4 yrs. software development experience; working knowledge of designing and developing oil and gas software applications, Oracle and Power Builder. M-F; 8am-5pm; $72,000/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202 & refer to Job Order Number CO 5014489.

Senior Systems Consultant sought by information technology consulting company in Denver, CO to work in Denver and other unanticipated job sites in the U.S. At a senior level, customize and implement customer relationship management (CRM) software at client sites. Perform business process requirements analysis, map core business processes into CRM systems. Configure CRM systems for client information flow, processing and output. Requires Master's or foreign equivalent in Business Administration; 2 yrs exp. performing the core duties and utilizing the technologies described above; certification in a major CRM software. M-F; 8am-5pm; $85,000/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver,CO 80202 & refer to Job Order Number CO 5014435.

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Job Number SAT-203: Two full time positions for Senior Systems Analysts as team leaders. Provides requirements analysis, database design/implementation of web based projects using COM+, Visual Basic, JavaScript, VBScript, IIS 5.0, Oracle, SQL Server 2000, ASP and TOAD. Provide technical assistance to Business Development in support of bid and proposal development for education related projects. Position requires MS in Computer Science or equivalent and 3 yr. exp. with client server/web applications.

Job Number SAE-203: Sr. Systems Analyst experienced to perform system integration, analysis, design and development, implementation, Support of 2-tier and 3-tier business applications using Oracle, PL/SOL, PL/SOL Cartridges, C, Visual Basic, Active Reports, ASP, JavaScript, HTML, Powerbuilder, IIS, PVCS, UNIX, Visual SourceSafe, Data modeling using ERWIN & Visio 2000, Install/Administer/support Windows NT/Novel Netware networks, manage/assist Programmers. Position requires BS + 5 yr. exp. in job duties.

Job Number SAS-203: Programmer Analyst to perform system integration, programming using Oracle, Visual Basic, Active Reports, ASP, JavaScript, HTML, PL/SOL, Toad, SOL Server 2000, and Visual SourceSafe on Windows NT network using client server and web applications, modeling using ERWIN & Visio 2000. Position requires BS + 1 yr. general software consulting exp.

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Must have experience in cross platform integration between MetaSolv TBS System and AS400 Billing System using Vitria's EAI software and with SAP Sales & Distribution module & ABAP language. Must be experienced in Database Administration, B2B/B2C eCommerce standards & development, OSS Systems Model/Development. Must have web development experience using HTML, DHTML, ASP, Java, J2EE, JSP, Java Servlets, XML, JavaScript, Visual Basic, VBScript, Oracle 8/8i, and SOL Server 6.5/7.0. Must be conversant with PHP, Apache, TomCat, EJB, C++, COM/DCOM, Active-X, PL/SQL PHP and UML in a Windows NT/2000, and Linux environment.

Candidate must possess a graduate degree in Information Systems or engineering with at least three years of experience. Send resume to VisionSoft International, Inc. 1278 Killian Knoll Circle, Lilburn, GA 30047. Attn. Antony Arputharaj

Training Instructor wanted by optical networking systems developer in Oceanport, NJ. Must have a Bachelor's Degree or equivalent in Electrical Engineering, or related field and 1.5 yrs. experience in Switch Networking for Optical Networks in Global Carrier environment with at least six months as a Trainer. Respond to Doreen Connors, HR Department (ref# 025), Tellium, Inc., 2 Crescent Place, Oceanport, NJ 07757.

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Senior Programmer Analyst

Pitney Bowes Inc. has an immediate opening in its Stamford, CT office for a Senior Programmer Analyst.

Work as part of an e-Commerce application team within the Company's e-Commerce and Product Supply area of IT to develop new web-based applications and support existing production of web-based applications utilizing various software.

Must possess at least a bachelor's degree or its equivalent in Computer Science or a related field and relevant experience as a Programmer, as well as with the software development lifecycle, HTML, Java, JavaScript, SOL, ASP, Broadvision and Oracle.

Resume and/or cover letter must reflect each requirement above and specify reference code SPA or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700.

F/T Projects Consultant. Responsible for providing technical support for database administration & for updating Oracle databases & initiation of new code path policies working w/ Oracle & C programming, UNIX, SOL & PL/SOL. Assist in developing databases for translation purposes & creating new applications to initiate new product releases to customers & database tables. Develop testing strategies, plans, conditions & analyze codes to determine database population & defects in customer's telecommunications billing software & document results. Install & assist w/ upgrades for in-house translation tools & provide support for translation issues regarding database or source code for the Graphical User. Must have Bachelor's degree in CS, Engineering or related field. Foreign degree equiv. accepted. Must have 1 yr. exp. in job offered or position w/ same duties. Send resume: Betsy Moya, SchlumbergerSema, 701 Waterford Way, Suite 300, Miami, FL 33126.

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Don Trotta, chief technology officer for **Citibanking** North America, says banking remains a multi-channel business where customers call, click or stop in. "That's the cool thing – the integration of customer experience across all the channels. When we originally came out with our mission to provide financial services anytime anywhere, many of the things we can do today didn't even exist," he says.

One of the primary challenges faced by financial IT leaders is creating a sense of personality – and brand loyalty – through the various channels by which services are offered. "When a customer uses an ATM, goes to our web site or visits a branch, we want them to come away knowing that **Citi** is providing that best experience available. We have our own [creative] sessions in which we imagine every step of that customer's experience – we're thinking of technology in an entirely different and more compelling way," Trotta says.

In addition, the barriers are falling that prevented total consumer financial service, creating an entirely new business model for the financial industry that relies on information and data. For instance, **Citigroup** is parent to **Citibanking**, as well as **Travelers Insurance** and **Salomon Smith Barney**. According to Trotta, the result is an entirely new business model driven by customer need vs. specific products.

To fulfill this new business model, Trotta and his peers are looking for people who can analyze the framework of the business and customer needs, and then apply technology. "We need people who can create solutions for customers and who have the ability to acquire new technology skills," he says. The career path in the financial industry for IT experts is broad, according to Trotta. "We have a significant number of former IT leaders who now head businesses." The industry has remained stable in terms of employment for IT professionals as demand for integration, security, modeling, service and support has continued to develop.

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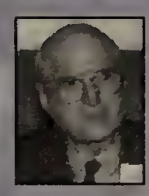
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Merger
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User worries might be well-founded because HP and Compaq have overlapping products in the server and desktop arena. HP's NetServer line overlaps with Compaq's ProLiant systems. HP has developed HP-UX, its own flavor of Unix, while Compaq has Tru64 Unix.

"If the product lines are combined, will we see increased support because there will be fewer products, or an erosion if the support folks have to [handle] what currently are competing products," Fritz says.

Rodric O'Connor, CTO at Putnam Lovell Securities in San Francisco, says his company has HP and Compaq gear, and thinks his mix of products will keep him safe. "We use Compaq servers and HP printers and LAN switches. I don't expect any negative impact to our operations. [But], if I were using Compaq or HP desktops, HP Intel servers or Compaq Alpha I would have some concern about the change in product mix."

The product mix is a worry for some users who say a merger of the two companies could lead to a "dumbing down" of core technologies. In other words, they worry the new HP will focus on commodity products such as Intel-based servers and Microsoft software, instead of investing in high-end server systems. Others are concerned the company would quickly turn away from unprofitable server lines.

Reduced selection

"Obviously, [the merger] reduces the number of vendors and limits the selection, but I don't consider Compaq to be a contender anymore," says Robert Currier, director of data communications at Duke University in Durham, N.C. "If HP can bring them into the 'HP way,' there may be a chance that Compaq will be able to regain some market share. [It] really depends on how willing the Compaq folks are to doing things in a different way."

That change will give corporate executives as well as technical engineers a "huge challenge," says Paul Edmunds, senior network analyst at Duke Energy in Charlotte, N.C., which uses HP's OpenView software. He doesn't expect the HP/Compaq merger to affect his company too much.

"The two companies have overlapping hardware lines, and they'll have a big integration pro-

See Merger, page 68

HP/Compaq campaign: the experts sound off

■ BY LINDA MUSTHALER



All these companies coming together — including Digital and Tandem as part of the Compaq side of the equation — have a strong heritage of technical innovation.

The votes are in, and Hewlett-Packard has proclaimed victory in its fight to acquire Compaq. While I'm not a Pollyanna and I don't underestimate the vast challenges ahead for HP, there will be some positive aspects of the merger in the long run for the network executive.

For starters, the product line (eventually) will be awesome. The new HP could offer a computing package for virtually every situation. Yes, some current products will go away, but the surviving products will be best-in-class. And I'm not just talking about hardware. The new offerings will include hardware, software, middleware, systems management tools, operating systems, and services and support. The product lines will look cobbled together for a year or two, but after that they should work well together. (Think OpenView on ProLiant.)

In addition, the company should have increased leverage with its partners, including application vendors such as Oracle and SAP; operating system vendors such as Microsoft and Red Hat; and other third-party independent software vendors (ISV). When it comes to partner alliances, size matters. HP platforms will be among the first to see ports and new developments from ISV partners. In addition, Intel and other component manufacturers will want to sidle up to the new giant.

Next, all these companies coming together — including Digital and Tandem as part of the Compaq side of the equation — have a strong heritage of technical innovation. While "Invent" may be the HP slogan, it's a birthright for all four companies. The number of patents these companies hold is truly astounding.

The merger bodes well for the HP researchers and developers who will be bringing us tomorrow's technologies. Research is expensive, and the size of the new HP will help sustain its research-and-development efforts. HP researchers will work on entirely new categories of technologies, such as nanoelectronics and future data-storage systems, not just new ways to package and market today's products.

Network World readers who pursue technical certifications also should benefit from the merger. Compaq has a strong and meaningful certification program called the Compaq Accredited Professional. If HP is smart, the company will adopt and expand this excellent program, giving more people the opportunity to learn about and certify on a broader range of technologies.

No matter which side of the merger fence you sat on, it's time to look for the positives in the deal. HP is the new 800-pound gorilla that will have a lot to offer the IT community.

Musthaler is vice president of the Houston technology assessment firm, Currid & Company. She can be reached at Linda@currid.com.

■ BY FRANK DZUBECK



[The merger] will add an additional level of uncertainty and doubt to every customer decision for the next year or longer.

First and foremost to set the record straight, I have no stock holdings in Hewlett-Packard or Compaq and neither company is a client of Communications Network Architects.

In the computer industry some basic truisms always will exist. One such fact is that no significant merger has ever been executed that produced increased value for shareholders and increased customer relationships. A short history lesson is now mandatory for the reader: Honeywell and General Electric; Univac and RCA; Sperry Univac and Burroughs (Unisys); Motorola and Four Phase; Silicon Graphics and Cray; Hitachi and National Semiconductor; Bull, NEC and Honeywell; Fujitsu and Amdahl; AT&T and NCR; Siemens and Nixdorf; Compaq and Tandem Computers; Compaq and Digital Equipment; and Hewlett-Packard and Apollo Computer. An impressive list of failed mergers.

Setting historical precedence aside for the moment, ask the question: "What customer business problem does the merger solve?" None. It will add an additional level of uncertainty and doubt to every customer decision for the next year or longer. The size and complexity of the merger is an obvious issue. More of a concern is the promised immediate removal of $2.5 billion in operational costs through staff reduction, asset consolidation, the redirection of cash flow to merged segments that provide higher return on investment, and the pruning of underperforming products and businesses. This inward focus by management on cutting costs, coupled with removal of product overlap, integration of sales/distribution channels, agreements and systems, and culling of channel partners will assure that technological/product creativity and inventiveness "ride the back of the bus" in the corporation.

Last but not least is the concern that a personnel drain will occur in the product segments of the merged businesses. The public outcry by irate Hewlett-Packard employees has sent a shock wave into both customer bases. The most recent demonstration of this negative exposure was at the HP shareholder meeting. All customers know that a key to a corporation's strength or weakness is its employees. On a day-to-day basis it's the "Indians not the chiefs" who deliver to the customer.

A great deal has been written in the press about the in-depth pros and cons of the merger from an internal vendor perspective: cost reduction, better margins, synergistic product lines, evolution into a solutions company, among others. During the past few weeks I have talked to vendors that HP, Compaq and channel partners have contacted, and I have also talked to customers and channel partners directly. The message is loud and clear: The damage has been done and whatever the outcome of the vote, a great number of customers is up for a change. This may be the first "lose-lose" computer merger no matter the outcome of the shareholder votes.

Dzubeck is president of Communications Network Architects, an industry analysis firm in Washington, D.C.

IETF

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90 [draft documents] related to LDAP. We need to figure out how many are really needed."

The LDAP task force is one of several applications-oriented initiatives launched at an IETF meeting last week in Minneapolis. The IETF also plans to establish a task force to consider how key application protocols will be affected by the migration to IPv6, a long-anticipated upgrade to the current version of the Internet Protocol, IPv4.

Meanwhile, the IETF displayed a new protocol for secure, dynamic updates to DNS on the networks built to support the meeting last week. Proponents of the new protocol say it will solve administrative headaches for network managers by letting them allocate a single host name to each laptop and computer, regardless of the IP address the system is assigned in the office, at home or on the road.

The LDAP upgrade is the most important work going on in the IETF's Applications Area, according to Ned Freed, the other Applications Area director and a distinguished engineer with Sun.

"Network managers are going to end up with products that interoperate better and are more secure," Freed says. He predicts that products that incorporate the LDAP enhancements will hit the market as early as next year.

The LDAP task force consists of 10 experts in directory services, including representatives of OpenLDAP, Sun, Verizon and Cisco.

The group will review the IETF's ongoing LDAP work, which includes putting the finishing touches on LDAP Version 3. This version of the protocol is the first to mandate a single, standard security mechanism for authenticating users and controlling access to information. Today's LDAP products use different security mechanisms, so a standard in this area should aid in interoperability.

"We're trying to move all the standards activity to LDAP Version 3, which solves the security issues of LDAP Version 2," Faltstrom says.

The task force also will ensure that LDAP Version 3 is aligned with a separate protocol dubbed LDUP — for LDAP Duplication/Replication/Update Protocol — that will provide a standard method for server-to-server and server-to-client replication.

"Every product has a replication mechanism, but they're not standardized," Freed explains, though he warns that it will "take a while for existing LDAP products to incorporate LDUP."

Freed and Faltstrom predict the LDAP task force will be active for the next year.

Similarly, the IETF's Applications Area is setting up a task force to review the IPv6 implications of major protocols, including LDAP, Simple Mail Transfer Protocol, Post Office Protocol, Internet Message Access Protocol, HTTP and FTP. The task force would recommend how best to update these widely deployed protocols for compliance with IPv6.

IPv6 uses 128-bit addresses that can support a virtually unlimited number of computers and devices connected directly to the Internet. IPv4 uses 32-bit addresses and can support approximately 4 billion systems. Finalized by the IETF in 1998, IPv6 is gaining support in Europe and Asia, where fewer IPv4 addresses are available. However, the U.S. network industry's interest in IPv6 has lagged.

"For each protocol, we need to figure out how we're going to set up connections over IPv6," Faltstrom says. He adds that all the major Internet applications — from e-mail server software to Web server software — will need to be upgraded to support IPv6.

The IPv6 task force will report to the two Applications Area directors before the IETF's next meeting, which will be held in Yokohama, Japan in July. Faltstrom says there is some urgency in getting the Internet's most popular applications ready to run on IPv6.

"We thought people would start moving to IPv6 in the edge [of the network], and then it would move out to the core. But it's starting in the core," Faltstrom says. "In another year, most ISPs will have IPv6 on all their routers. It will just be a question of pushing a button to turn it on. . . . It's like a snowball: When it starts rolling, it will be rolling really fast."

Freed says getting key applications protocols ready to run in IPv6 is one of the Applications Area's top priorities.

Meanwhile, the IETF's new Secure Dynamic Updates in the DNS protocol is a boon to network managers struggling with static IP addressing. This new protocol tells a DNS server what IP address a particular user has at the moment. It lets end users keep one host address while using any IP address, depending on their locations.

This technique should encourage more network managers to use Dynamic Host Configuration Protocol, which lets them assign IP addresses dynamically. The alternative is for network managers to use static IP addresses. With this new protocol, network managers can use static host names but dynamic IP addressing. Once deployed in DNS and operating system software, the protocol will automatically update network managers' information about their host computers. ■

More IETF coverage online

- Leslie Daigle has been named chair of the IETF's Internet Architecture Board, marking the first time a woman has been named to this key post. **DocFinder 8659.**
- Daigle sat down with *Network World* Senior Editor Carolyn Duffy Marsan to discuss the board's agenda. **DocFinder 8660.**
- A working group has begun developing a plan for prioritizing voice and data communications sent by public safety officials via the Internet in the event of a disaster. **DocFinder 8661.**

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Merger

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ject ahead of them," Edmunds says. "Never mind the cultural challenges, how do you keep the HP culture and motivate the workforce, especially if you lose something like 15,000 people?" HP has acknowledged that employee reductions of that magnitude will be in the offing upon merger agreement.



"How will Compaq and HP merge their competing product lines — and how will they support them?"

Jeffrey Fritz
Director of networking, West Virginia University

"The ability to execute the merger quickly with few missteps will be critical. We are skeptical [because Compaq may] have a lot of baggage from past acquisitions that is still unresolved," says Doug Cavit, CIO at McAfee.com. By all accounts, Compaq is still suffering indigestion from paying $9.6 billion for Digital in 1998. For its part, HP tried to buy out PricewaterhouseCoopers last year but failed. So history isn't on either company's side, users say. Meanwhile, both companies still are smarting from $80 million-plus losses in the second quarter.

"The merger certainly opens up again any decision for a particular vendor potentially to the combined companies' disadvantage — basically that by having uncertainty or lack of product road map clarity, it opens up the field for competitors to move in and influence buying decisions," Cavit says.

Dell, IBM benefit?

One IT executive says failure could leave two companies sitting pretty if HP doesn't handle the transition well. "Dell and IBM could be the big winners, not the merged company," says Chip DiComo, manager of global information systems at Hellman Worldwide Logistics, a transportation company in Miami.

Others disagree. "Servers are one of Compaq's crown jewels, so I don't think HP is going to do anything to screw that up," says Ed Mann, vice president of network planning for Prudential, which uses HP printers and Compaq servers.

Compaq shareholders were a lot more optimistic about the merger, approving the company's planned acquisition by HP by a 9-to-1 margin last week. The official result of HP's shareholder vote is not yet known. HP said preliminary results show the merger has been approved by what CEO Carly Fiorina termed a "slim but sufficient" margin. Opposition leader Walter Hewlett, an HP board member and son of a company founder, said the results are too close to call and that he remains "optimistic" the acquisition will be defeated. IVS Associates is handling the vote tabulation and will certify HP's vote outcome, a process expected to take several weeks. ■

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BackSpin Mark Gibbs



The tactics of dirty pool

"You may not be interested in strategy, but strategy is interested in you."
— Leon Trotsky

After the dot-com bubble burst there was what seemed like endless chanting of "see, we told you" and "business without a profit goal isn't business." The former was merely irritating, while the latter highlighted something that has been going wrong with business for years.

That something is a lack of strategic thinking. Had the majority of the now defunct dot-coms and their venture capitalists looked at the long-term picture, they would have realized that smoke and mirrors don't equal real, sustainable business. But, of course, you, gentle reader, know all about this....

The reason I bring up strategic thinking is that there is precious little of it going on in the classic business sense of strategy. Before we discuss the consequences of this, let us draw a distinction between strategy and tactics. According to Cambridge Dictionaries Online (http://dictionary.cambridge.org):

Tactic, noun: a planned way of doing something.

Strategy, noun: a detailed plan for achieving success in situations such as war, politics, business, industry or sport, or the skill of planning for such situations.

The difference between the two lies in doing one thing to attain a specific goal (such as, "green ball in the corner pocket") or doing many things to achieve an overall goal (for instance, "beat Bob at pool").

Now way back when business ran slower than it does today, strategic planning concerned a timeline that extended three to five years out. But over the past decade we have seen the velocity of business increase fantastically, and the time for decisions has shrunk to the extent where what you're going to have for lunch is a major strategy decision.

No longer are there weeks or days to evaluate a need and plan for integration with existing systems — it is a case of do it now, no excuses. This fosters a way of thinking focused on tactical opportunity gain in place of strategic benefit and consequences.

Which leads many IT groups into an interesting problem when it comes to acquiring new technologies: There's no time to really learn about and understand a new product, yet there's often an incredible push to get the product in.

The result is that the IT group's product acquisition process gets front-ended by fact-finding under the guise of issuing a request for proposal. In reality, the IT guys aren't asking for proposals at all, they're asking for a request for information.

This tactic can keep the strategy stalled for months while more and more information is collected through repeatedly refining RFPs. It's dirty pool whichever way you look at it.

For a vendor, this ruse is an incredible waste of time, while for the actual internal customer it stalls getting a solution in place. But for IT, it works great! IT can say they are just doing their job thoroughly, while in fact they are covering their behinds and getting some breathing space.

But even when such ploys aren't used, the tactical nature and unseemly speed of many corporate technology acquisitions leads to serious problems. A common consequence of short-term, tactical opportunity gains is long-term snafus.

Take a couple of minor decisions forced onto IT by pressure from other groups, run those decisions out over a few months, throw in some required system reconfiguration and voilà! Things stop working, or worse, don't work consistently.

And now it's IT's fault!

It's no good crying "they made us do it!" — that didn't work when you were in grade school and it sure isn't going to work now.

It's time for IT groups to start pushing their organizations back into strategic thinking about how IT should be done and its relationship with business processes. It's also time to stop playing dirty pool.

Comments in the corner pocket to nwcolumn@gibbs.com.



'NetBuzz News, insights, opinions and oddities

Paul McNamara

A good idea in search of seed money

They're still out there, all right: bootstrapping entrepreneurs unbowed by the earthquake that has flattened so much of the technology marketplace, particularly start-ups.

Why not? Somebody has got to resume making money sometime. And with fresh signs of an economic rebound appearing daily, it's time for the venture capital crowd to begin placing a new round of bets.

Campbell Stras, president of Class M Planet, believes he and his tiny band of Boston-area colleagues have a shot at attracting some of that action. His start-up is pitching an answer to an increasingly urgent question network executives face: "How do we provide wireless e-mail devices such as the BlackBerry to every employee who wants one . . . without busting the budget?"

Stras is knocking on doors as we speak in search of seed money to back the company's mHook server. This appliance would sit behind a firewall and work with a variety of corporate e-mail systems to let mobile workers have messages that arrive from important, designated senders — boss, clients, spouse, bookie, etc. — pushed to the Short Message Service-enabled cell phone or wireless handheld device that they've already been issued. There are a number of interesting wrinkles that would lead one to believe that mHook might find a home in larger companies.

The most compelling one? Stras says a customer can provide this critical e-mail link to workers for 75% less per employee than it costs to issue and support a BlackBerry . . . not that he envisions slaying that Goliath. (He noodled out the math for me, and it looks reasonable.)

"It's a complement to BlackBerry, because there are always going to be people in corporations who really need BlackBerry and can really justify BlackBerry," Stras says. "But then there is a much larger market of mobile users who really don't want to get all of their e-mail all of the time — that would drive them crazy — but they'd like to get some critical e-mails, such as from their boss or somebody on their project team."

They've got a few dozen users hooked on mHook beta deployments, Stras says, with most of them at Analog Devices, where he was once employed.

"I think that we'll get a seed investment in the next 30 to 60 days," he says. "I'm really hopeful."

Bad news if you like good stuff online

According to Jupiter Media Metrix, 70% of adults in a recent survey said they cannot understand why anyone would pay for online content.

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The trouble is that doesn't seem to be the trend. That same Jupiter survey found that a slightly smaller percentage — 42 today vs. 45 in August 2000 — believe that paying for content is inevitable.

It's clear that content providers have a lot of work left if they are ever going to move those numbers in a direction that would lead their companies toward profitability.

Evil-doers have met their IT match

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